Report of the Canadian E-Business Opportunities Roundtable

January 2000

# *FAST* FORWARD:

## Accelerating Canada's Leadership in the Internet Economy

Prepared by The Boston Consulting Group (Canada)

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# PREFACE

The Canadian E-Business Opportunities Roundtable was formed in mid-1999 to develop a strategy for accelerating Canada's participation in the Internet economy. Its goal was to establish Canada as a globally recognized e-business leader to promote a higher quality of life for our citizens through economic growth, job creation and more convenient access to information, goods and services.

The Roundtable's work was guided by a sense of urgency. Canada is well-positioned to take advantage of the opportunities offered by e-business, but is not aggressively rising to the challenge. Canada faces a choice. We can capitalize fully and quickly on the e-business opportunity or remain complacent with our modest success and risk falling behind other advanced economies. We can make e-business a sustainable engine of growth and jobs for the Canadian economy or we can hesitate and watch many of our best ideas and people migrate to more hospitable environments. In short, we can lead or lag. The Roundtable's goal is to inspire Canadian businesses to choose leadership and to chart a course that will take them there.

The Roundtable began its deliberations with an assessment of the e-business opportunities and impediments facing Canada. After several months of research, analysis, consultation and discussion, the Roundtable produced this report, with five broad objectives in mind:

- To provide a comprehensive overview of the current state of e-business in Canada.
- To present a compelling vision for the development of Canada's Internet economy, including aggressive targets and opportunities for global leadership.
- To identify strategies for industry, the educational sector and government to realize this vision.
- To inspire Canadian business to approach the opportunities presented by the Internet with a sense of urgency.
- To persuade Canadian governments and regulators that facilitating the development of Canada's Internet economy should be a priority.

This report speaks to a wide audience of Canadian thought leaders and decision makers in the business, government and educational communities. It is for current and potential participants in the Internet economy – a group that includes not only pure Internet businesses, but also the hardware suppliers, service and content providers, software developers, financiers and professional service providers that support those businesses. It includes existing Canadian businesses and institutions, large and small, across all sectors, which can embrace the Internet as a new way to do business more rapidly, efficiently, and profitably.

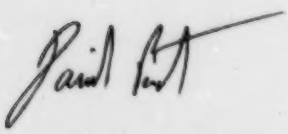
The Roundtable was initiated by The Boston Consulting Group (BCG), a global strategy firm that works extensively in e-commerce. Recognizing that Canada was well-positioned but not well-prepared to participate in the Internet economy, BCG Canada proposed the formation of the E-Business Opportunities Roundtable and received the full support of the federal government in launching this effort.

Under the joint direction of BCG and Nortel Networks, the Roundtable has been a voluntary private sector-led initiative in which the public sector has been a full and equal partner. All members of the Roundtable have made a substantial contribution to the process and to the report. In particular, we wish to recognize and thank the Honourable John Manley, Minister of Industry, and Kevin Lynch, Deputy Minister of Industry Canada, who have played a key role throughout the process and facilitated access to the federal government's research and policy resources.

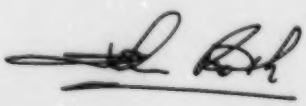
The Boston Consulting Group of Canada provided a team of consultants on a *pro bono* basis to guide the process and provided research, analytical and organizational support. This team, led by Sara Allan, included Kevin Bright, David Sturdee, Michael McAdoo, Rob McGill, Julie Gray, Ken Broekaert, John Macris and Shauna Brail. In addition, several Roundtable members appointed representatives to a working group to help review the findings and shape the recommendations, and we thank these individuals, listed in Appendix C, for their participation and contribution. Special thanks to Richard Simpson, Director General, and Pamela Miller, Senior Policy Analyst, of Industry Canada's Electronic Commerce Task Force, who provided invaluable support and access to Industry Canada resources.

We also acknowledge the contributions of J. Scott Wilkie, Geoff Taber, Matthew Golden and their colleagues at Osler, Hoskin & Harcourt LLP, and Richard Nathan of Brightspark, who provided legal consultation and research on several important issues, also on a *pro bono* basis. Our thanks to Professor David Wolfe of the Department of Political Science at the University of Toronto, who worked with the research team to examine the role that governments are playing as catalysts to e-business development in other countries, and to Helen Burstyn and Karen Rosen of Advance Planning & Communications Inc. for providing editorial and communications assistance.

Finally, the Roundtable would like to thank the many individuals, companies, institutions and organizations that were consulted during the Roundtable process and helped shape these findings. We hope the report reflects your valuable insights and fully addresses both the opportunities and challenges that surfaced during our discussions.



David Pecaut, Co-Chair
Managing Director
The Boston Consulting Group (Canada)



John Roth, Co-Chair
Chief Executive Officer
Nortel Networks

## MEMBERS OF THE ROUNDTABLE

| | | |
|---|---|---|
| David Pecaut (Co-Chair) | Managing Director | The Boston Consulting Group (Canada) |
| John Roth (Co-Chair) | CEO | Nortel Networks |
| Shahla Aly | Vice President, E-Business Services | IBM Canada |
| Kathryn Beaton | Chief Information Officer | Ontario Hydro Services Company |
| Rick Brown | Vice President, Strategic Planning | Sears Canada Inc. |
| Jeff Chisholm | Vice Chair, Electronic Financial Services & President mbanx | Bank of Montreal |
| Gaylen Duncan | President and CEO | Information Technology Association of Canada (ITAC) |
| John Eckert | Managing Partner | McLean Watson Capital |
| Bill Gibson | CEO | Mountain Equipment Co-op |
| Robert Greenhill | Vice President, Strategic Initiatives | Bombardier Inc. |
| Louise Guay | President | Public Technology Multimédia |
| Dean Hopkins | President | Cyberplex Inc. |
| Pierre Laferrière | Special Advisor to the CEO | Teleglobe Inc. |
| Claude Lajeunesse | President and Vice Chancellor | Ryerson Polytechnic University |
| Pat Lavelle | Chairman of the Board | Export Development Corporation |
| Martin Lippert | Vice Chairman and CIO | Royal Bank of Canada |
| Vernon Lobo | Managing Director | Mosaic Venture Partners |
| Kevin Lynch | Deputy Minister | Industry Canada |
| Ronan McGrath | CIO, President of Shared Services Company | Roger's Communications Inc. |
| Peter Nicholson | Chief Strategy Officer | BCE Inc. |
| Ken Nickerson | General Manager, Consumer and Commerce | The Microsoft Network Canada Group |
| Kelvin Ogilvie | President | Acadia University |
| Gerry Pond | President, IT and Emerging Business | Aliant Inc. |
| Anna Porter | Publisher and CEO | Key Porter Books |
| Jesse Rasch | President and CEO | Webhosting.com |
| Jean-Pierre Soublière | President | Anderson Soublière Inc. |
| Larry Stevenson | President and CEO | Chapters Inc. |
| John Wetmore | President | IBM Canada |
| Sheelagh Whittaker | President and CEO | EDS Systemhouse Inc. |
| Ted Wozniak | Vice President, Information Technology & Executive Director | Magna International Inc. |

# EXECUTIVE SUMMARY

The Internet has revolutionized the way that individuals, institutions, industries and nations interact by broadening the reach and increasing the depth of communication. It is transforming the buying and selling of goods, and enriching the exchange of information.

The low cost and open standards of doing business online enable both start-ups and existing small companies to compete in arenas that were traditionally open only to large players. New business models, such as online intermediaries, auctions and exchanges, are changing the way entire industries function, and enabling companies to compete internationally with a virtual, instead of a local, physical presence.

## Canada in the Internet Economy

Canada is well-positioned to be a leader in the Internet economy, given its sophisticated infrastructure, its highly connected population and its early Internet policy initiatives. Canada already has the highest share of global e-commerce revenues after the U.S., with the Canadian Internet economy representing more than $28 billion in revenues and 95,000 jobs in 1998. If Canada moves aggressively, the Internet economy could climb to $155 billion in revenues and create 180,000 incremental high value jobs by 2003, which would translate into substantial increases in productivity and competitiveness. This is a tremendous opportunity for Canadian business within Canada, and beyond our borders.

But this growth is by no means assured. Canada currently lags the U.S. in both business-to-consumer and business-to-business e-commerce. While Canadian consumers are browsing, they are not yet buying as much online as their U.S. counterparts. Similarly, fewer Canadian businesses use the Internet to conduct business with their suppliers and customers.

Canadian companies need to move quickly and decisively to protect their home markets and expand into new markets. We are already seeing too many Canadian consumers and businesses relying on U.S. Internet sites, too few Canadian businesses migrating online, and too many Canadian Internet entrepreneurs taking their ideas, talents and businesses to more dynamic, congenial markets.

## The Stumbling Blocks

***The Complacency of Existing Business***

A number of factors are constraining existing Canadian organizations from developing successful online businesses:

- A **lack of urgency** on the part of many Canadian business leaders, for whom the Internet is simply not yet a strategic priority.
- The fact that **Canada is a small market** with a limited number of online customers, which means that domestically focused companies cannot build scale quickly and leverage the broad reach of the Internet as easily as large U.S.-based companies.
- A **shortage of talent** to fill critical IT jobs, a problem in both Canada and the U.S., is creating an overheated and highly competitive market for the people needed to build an e-business.
- For Canadian retailers, the **false sense of security** that the border has created in sheltering them from U.S. competition. For now, the cost of goods purchased from U.S. sites may be higher and fulfillment less reliable, but Canadian retailers will soon face real competition as these cross-border barriers fade.

Given the lack of peer and supplier pressure to move online, many Canadian companies may be becoming complacent about the opportunities and threats of the Internet. But the risks of inertia are substantial and potentially permanent. Canadian companies who ignore or wait out the Internet revolution may forfeit first mover advantage in the online market and accompanying global growth opportunities; they may be forced to compete for business against global Internet players with scale advantages; and they may risk losing traditional supply relationships as online intermediaries emerge and more large companies shift their procurement online.

***Absence of E-Business Clusters***

In the U.S., rapid e-business formation and growth has been concentrated in clusters of activity in and around specific regions – primarily, San Francisco, Boston and New York City – where a set of key ingredients combine to fuel spectacular rates of new company formation. The emergence and success of these e-business clusters depends on three conditions in particular: the presence of Internet-savvy, participative early-stage capital providers, strong research and educational institutions with active industry ties, and high tech anchor companies.

While Canada has some nascent clusters, there is a shortage of early-stage venture capital to invest in Internet-based companies. In Canada, the pool of venture capital is smaller than that in the U.S. because there are fewer institutional investors, smaller deals and a venture capital market dominated by 'passive' government and government incented funds that are permitted only a limited ownership stake in the companies in which they invest. Linkages among universities, business and the financial community are generally weaker and less frequent than in the U.S., and the linkages that do exist are often too sub-scale to drive rapid new business creation. While Canada has some strong anchor companies in the high tech sector, there is not enough critical mass in most geographies to spin off many satellite companies.

***Bottlenecks in the IPO Pipeline***

Companies that manage to attract early stage capital in Canada often encounter many bottlenecks in the pipeline as they progress from new business start-up to the initial public offering (IPO) or sale of the company:

- Canada's IPO market for Internet companies has lagged well behind that of the U.S.: in 1999, there were only 4 deals on the TSE compared to 165 deals completed on Nasdaq.
- Current tax and securities regulations inhibit early-stage capital formation on a large scale, and high capital gains taxes in Canada discourage investment, making it difficult for Canadian funds to expand by attracting foreign investors.
- Exit strategies for early-stage investors are inhibited by restrictions on Canadian companies doing share-for-share mergers with foreign companies and by lengthy resale and escrow requirements.

Adding to these difficulties is our less dynamic environment for e-business, which is driving entrepreneurs and high tech workers south in search of opportunities. The exodus of Internet talent is also being driven by the perception and reality of more opportunities, higher salaries and lower taxes outside of Canada. Differences in the tax treatment of stock options between Canada and the U.S. make it difficult for Canadian companies to offer as attractive compensation structures to key employees.

## The Building Blocks

The Roundtable has identified six priority areas for accelerating Canada's e-business leadership, articulated a set of goals for achieving success in each area, and suggested specific tactics for attaining these results.

1. **Establish Canada's brand in e-business, domestically and globally** by building awareness of and confidence in Canadian companies' ability to compete in the global Internet economy and by boosting our profile internationally.

   **Canada's Goal** should be recognized leadership in e-business by achieving the highest rates of Internet usage in the world.

- Domestically, create a sense of awareness and urgency of the e-business challenge through private sector leadership on the part of business and industry associations.
- Build Canada's brand internationally by running a fast, focused campaign to market Canada to leading global e-businesses as a destination for investment.

2. **Accelerate the transformation of existing business in Canada** by providing the incentives and the tools for business leaders to invest in e-business.

   **Canada's Goal** should be to achieve the highest rates of Internet usage among small and medium-sized enterprises in the world and to build the largest Internet-related industry as a percentage of GDP.

- Create a time-limited tax incentive to raise awareness and adoption by all companies, and SMEs in particular.
- Create a student e-Corps initiative under the umbrella of Industry Canada's Student Connection program to provide cost effective e-business resources to SMEs.
- Accelerate sectoral adoption through industry association activities to mobilize members.

3. **Foster e-business creation and growth** by supporting Canada's emerging Internet clusters, ensuring that risk capital is available at all stages of business development, and by improving the incentives for entrepreneurs to build businesses in Canada.

   **Canada's Goal** should be to develop the world's largest pool of venture capital and the largest number of IPOs as a percentage of GDP.

- Support clusters by focusing research resources on Internet technologies.
- Foster the development of early-stage venture capital by:
  - Permitting deferred capital gains taxation on qualified investments.
  - Reducing the capital gains tax.
  - Eliminating barriers to cross-border share-for-share mergers.
  - Eliminating impediments to the flow of foreign investment into Canadian venture capital funds.
- Address factors that make the environment for initial public offerings (IPOs) in Canada less attractive than in the U.S.

4. **Expand the e-business talent pool in Canada** by enabling companies to make better use of stock options to attract and retain employees and by accelerating skills training and retraining to meet the urgent supply needs of the Internet economy.

   **Canada's Goal** should be to attract and retain a pool of e-business talent and to achieve among its broad population the highest Internet literacy rates in the world.

- Adjust the tax treatment of stock options to allow a deferral of taxation until the time of sale of the stock, and permit limited capital gains exemptions.
- Improve Internet literacy by making the International Computer Driving License a prerequisite for secondary and post-secondary graduation.

5. **Make government online a major priority for all governments in Canada** by assigning leadership responsibilities and setting aggressive targets.

   **Canada's Goal** is to become the most advanced digital government in the world.

- Make all government services available online.
- Create a government portal or online directory and search engine to improve access to information.

6. **Build Canada's leadership in international Internet policy development** by establishing a Canadian branded, internationally recognized consumer protection mark and forum for dispute resolution.

   **Canada's Goal** is to become a recognized centre of international Internet policy development, through widespread adoption of a Canadian trustmark.

- Create an internationally accredited trustmark for consumer protection that appears on the Web sites of companies in compliance with Canadian consumer protection guidelines.
- Expand Canada's international role in Internet regulation by developing a neutral dispute resolution body responsible for resolving domestic and international online disputes.

# THE INTERNET ECONOMY

The Internet has touched off a revolution in the way that individuals, organizations, industries and countries communicate and interact. It represents a powerful new channel for the exchange and dissemination of information, provision of services and transactions of every description.

Much of the recent media focus on the Internet has been on Internet-based commercial transactions, or e-commerce. Yet the Internet is more than a tool for buying and selling. It is a way of providing rich, often customized information about organizations, their products and their services. It facilitates information sharing between companies and their business partners, as in the case of automated inventory control systems or collaborative design systems. Moreover, for purveyors of information, goods and services, it is a channel that broadens their reach well beyond the confines of traditional organizations operating in the offline, physical world. Together with e-commerce, these online activities constitute the broader realm of e-business.

## THE ECONOMIC IMPACT OF THE INTERNET

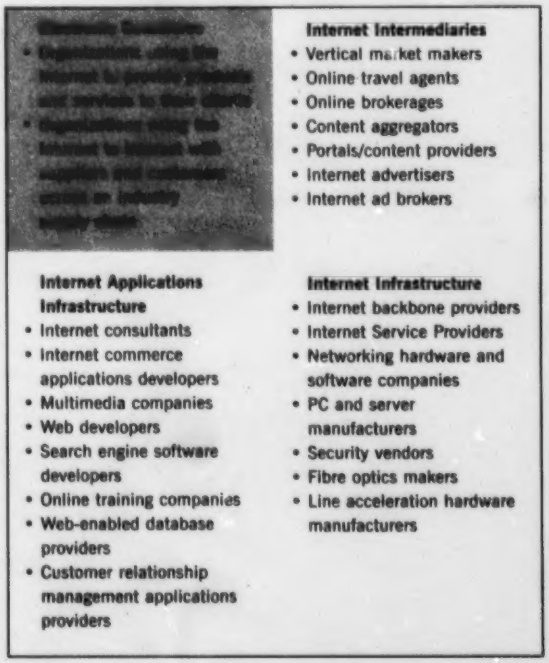
The impact of the Internet is being felt in every part of the economy. The effects are most visible, perhaps, in the retail sector, given the early and much-publicized successes of online retailers such as Chapters Online, Amazon.com and eToys, and auction sites such as Bid.com and eBay. Yet retail e-commerce represents only a fraction of the value of activity that takes place online. Indeed, in Canada, the entire business-to-consumer (B2C) online market is less than one-fifth the size of the Internet-based business-to-business (B2B) market (see Exhibit 1).

For existing businesses, the Internet represents far more than just an alternative sales channel. By providing an accessible, low-cost platform for interacting with existing or potential customers and business partners, the Internet is fundamentally changing the ways in which industries function. The Internet is removing some of the scale advantages that large, established firms once enjoyed and permitting nimble startups to displace them. The Internet is making it possible for companies to build a brand and reach new customers in geographic markets where a bricks-and-mortar presence was once required. The Internet is also making it possible for companies of all sizes along an industry supply chain to interact online, where in the past, proprietary Electronic Data Interchange (EDI) networks limited participation to a few large players. It is also giving rise to a new breed of online intermediaries that are breaking down traditional value chains.

### The Scope of E-Business

**An e-business:**
**(I)** Leverages the Internet for providing or sharing information, or for delivering services, and/or
**(II)** Realizes some or all of its revenues from
- Internet-based transactions
- the manufacture and/or sale of Internet-related products or services

**E-Business is broader than e-commerce:**




**Source:**
The Boston Consulting Group analysis, drawing on University of Texas at Austin study "Measuring the Internet Economy", sponsored by Cisco, 1999

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**E-Business is broader than e-commerce:**

**Electronic Commerce**
- **Organizations using the Internet to provide products and services to their clients**
- **Organizations using the Internet to interact with suppliers and customers across an industry supply chain**

**Internet Intermediaries**
- Vertical market makers
- Online travel agents
- Online brokerages
- Content aggregators
- Portals/content providers
- Internet advertisers
- Internet ad brokers

**Internet Applications Infrastructure**
- Internet consultants
- Internet commerce applications developers
- Multimedia companies
- Web developers
- Search engine software developers
- Online training companies
- Web-enabled database providers
- Customer relationship management applications providers

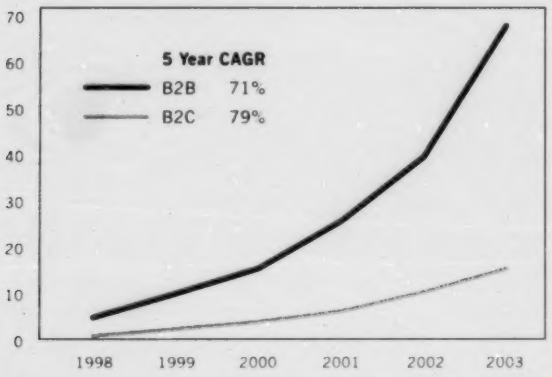
**Internet Infrastructure**
- Internet backbone providers
- Internet Service Providers
- Networking hardware and software companies
- PC and server manufacturers
- Security vendors
- Fibre optics makers
- Line acceleration hardware manufacturers

**Source:**
The Boston Consulting Group analysis, drawing on University of Texas at Austin study "Measuring the Internet Economy", sponsored by Cisco, 1999

## Exhibit 1: B2B vs. B2C E-Commerce in Canada

**Internet-Based E-Commerce in Canada**

*($B)*



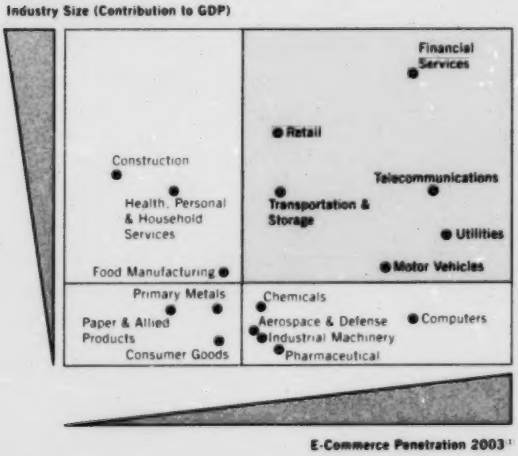

**Notes:**

(1) IDC, "Internet Commerce in Canada, 1998-2003"

(2) The Boston Consulting Group analysis based on BCG/shop.org report "The State of Online Retailing 2.0" and IDC data in IBM and Retail Council of Canada report, "e-Retail, The Race is On", 1999

## Exhibit 2: Projected Impact of E-Commerce in Canadian Sectors

**Projected E-Commerce Penetration by Industry**




**Note:**

(1) Based on The Boston Consulting Group projections of U.S. e-commerce purchases as percentage of total purchases in 2003 in each sector.

**Source:**

Statistics Canada for GDP; Boston Consulting Group for e-commerce penetration

No industry is likely to escape the influence of the Internet. Many sectors important to Canada's economy will migrate quickly to the Internet, including many traditional mainstays of the Canadian economy such as financial services, motor vehicles, telecommunications, transportation and storage, retail and utilities (see Exhibit 2). The Internet will be used by these and other sectors for both business-to-consumer and business-to-business information sharing, e-commerce, delivery of services and trading.

In the automobile industry, for example, both Ford and GM recently launched large-scale Internet initiatives for all supplier interactions – from product design to inventory management to order processing. Increasingly, global supply chains are being formed and facilitated by online exchanges:

- New players in the shipping industry are consolidating multiple buyers' global shipping contracts in one online exchange where carriers can bid electronically.
- Several major steel companies have banded together to form Metalsite, an online marketplace and resource centre, where registered users buy metal at fixed prices or by auction.
- Online catalogue software providers such as CommerceOne and Ariba are building international trading networks for goods and services, such as office products.

With changes in technology and improvements in network quality and available bandwidth, the Internet will continue to change the face and pace of business. Indeed, the impact of the Internet is only beginning to be felt, and the opportunities it presents are far from being fully realized.

## CANADA IN THE INTERNET ECONOMY

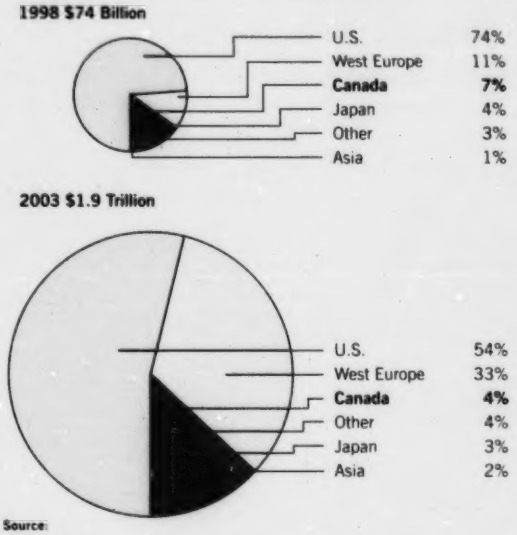
Canada is already a leader in global e-commerce. After the U.S., Canada had the highest share of Internet-based e-commerce in the world in 1998 (see Exhibit 3).

E-business revenues are beginning to represent a material share of Gross Domestic Product (GDP) in Canada. In 1998, Canada's total Internet economy was worth an estimated $28.5 billion, contributing 1.5% of total GDP[1] (see Exhibit 4). In contrast, the value of the Internet economy in the U.S. was $414 billion. In 1998, this portion of the U.S. economy employed over 1.4 million people, largely in high value, knowledge-based jobs.

The Internet economy in Canada is poised to grow substantially over the next few years. If it could achieve the same growth rate as that of the U.S., Canada's Internet economy would represent $156 billion in revenues by 2003. This could translate into annual GDP growth of approximately 0.6% and more than 180,000 new jobs (see Exhibit 5).

But this growth is far from assured. Though global leaders such as Nortel Networks illustrate Canada's strength in the Internet infrastructure layer, there are other layers of the Internet economy where Canada lags well behind the U.S. Canada is not yet a strong contender in several new and rapidly growing segments of the Internet economy that can drive significant job creation – Internet applications (Internet-related software, Web development and consulting) and e-commerce (business-to-business, business-to-consumer and intermediaries, such as brokers and portals).

### Exhibit 3: Canada's Current and Projected Share of World E-Commerce




**Source:**
IDC, 1999

### Exhibit 4: The Internet Economy

| | Estimated 1998 Internet Economy | | | | |
|---|---|---|---|---|---|
| | | U.S. | Canada | | Ratio of U.S./ Canada Revenue |
| **Internet Economy Layer** | **Revenue (CDN$B)** | **Jobs** | **(CDN$B)** | **Jobs** | |
| **Electronic Commerce and Intermediaries**<br>• B2B[1], B2C<br>• Portals, brokers | 206.3 | 762,000 | **5.5** | **17,300** | 38x |
| **Internet Applications**<br>• Software development<br>• Web development and consulting | 83.5 | 408,000 | **0.8** | **7,400** | 100x |
| **Internet Infrastructure**<br>• Hardware<br>• Network software<br>• Internet access | 170.6 | 473,000 | **22.2** | **70,400** | 8x |
| **Total** | 414.4[2] | 1,478,000[2] | **28.5** | **95,100** | 15x |

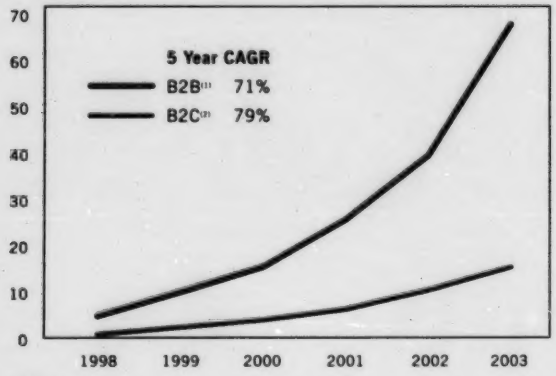
**Notes:**
(1) Internet-based transactions only. Does not include EDI/VAN.
(2) Total does not equal sum because double counting between Commerce and other layers is factored out.

**Source:**
The Boston Consulting Group for Canadian data; University of Texas at Austin for U.S. data. See Appendix B for methodology.

[1] The Internet economy is made-up both of e-commerce revenues and the revenues of the companies that offer the products and services that make e-commerce possible. Revenues were converted to contribution to GDP at the rate of 2.2:1. For a description of the methodology used, see Appendix B. All figures in Canadian dollars.

## Exhibit 1: B2B vs. B2C E-Commerce in Canada

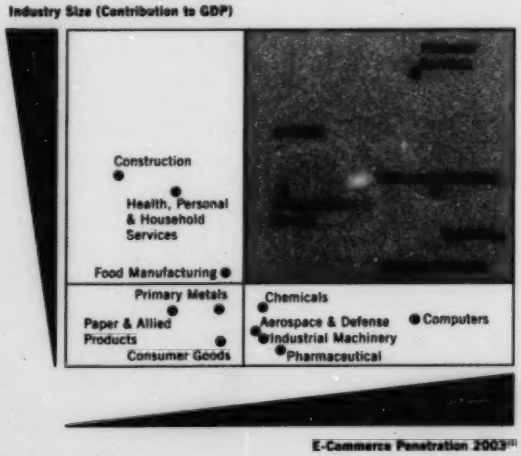
**Internet-Based E-Commerce in Canada**
*($B)*




**Notes:**
(1) IDC, "Internet Commerce in Canada, 1998-2003"
(2) The Boston Consulting Group analysis based on BCG/shop.org report "The State of Online Retailing 2.0" and IDC data in IBM and Retail Council of Canada report, "e-Retail, The Race is On", 1999

## Exhibit 2: Projected Impact of E-Commerce in Canadian Sectors

**Projected E-Commerce Penetration by Industry**




**Note:**
(1) Based on The Boston Consulting Group projections of U.S. e-commerce purchases as percentage of total purchases in 2003 in each sector.

**Source:**
Statistics Canada for GDP; Boston Consulting Group for e-commerce penetration.

No industry is likely to escape the influence of the Internet. Many sectors important to Canada's economy will migrate quickly to the Internet, including many traditional mainstays of the Canadian economy such as financial services, motor vehicles, telecommunications, transportation and storage, retail and utilities (see Exhibit 2). The Internet will be used by these and other sectors for both business-to-consumer and business-to-business information sharing, e-commerce, delivery of services and trading.

In the automobile industry, for example, both Ford and GM recently launched large-scale Internet initiatives for all supplier interactions – from product design to inventory management to order processing. Increasingly, global supply chains are being formed and facilitated by online exchanges:

- New players in the shipping industry are consolidating multiple buyers' global shipping contracts in one online exchange where carriers can bid electronically.
- Several major steel companies have banded together to form Metalsite, an online marketplace and resource centre, where registered users buy metal at fixed prices or by auction.
- Online catalogue software providers such as CommerceOne and Ariba are building international trading networks for goods and services, such as office products.

With changes in technology and improvements in network quality and available bandwidth, the Internet will continue to change the face and pace of business. Indeed, the impact of the Internet is only beginning to be felt, and the opportunities it presents are far from being fully realized.

## CANADA IN THE INTERNET ECONOMY

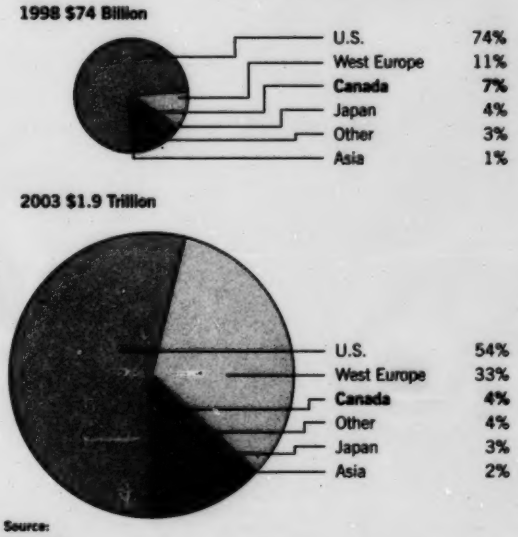
Canada is already a leader in global e-commerce. After the U.S., Canada had the highest share of Internet-based e-commerce in the world in 1998 (see Exhibit 3).

E-business revenues are beginning to represent a material share of Gross Domestic Product (GDP) in Canada. In 1998, Canada's total Internet economy was worth an estimated $28.5 billion, contributing 1.5% of total GDP[1] (see Exhibit 4). In contrast, the value of the Internet economy in the U.S. was $414 billion. In 1998, this portion of the U.S. economy employed over 1.4 million people, largely in high value, knowledge-based jobs.

The Internet economy in Canada is poised to grow substantially over the next few years. If it could achieve the same growth rate as that of the U.S., Canada's Internet economy would represent $156 billion in revenues by 2003. This could translate into annual GDP growth of approximately 0.6% and more than 180,000 new jobs (see Exhibit 5).

But this growth is far from assured. Though global leaders such as Nortel Networks illustrate Canada's strength in the Internet infrastructure layer, there are other layers of the Internet economy where Canada lags well behind the U.S. Canada is not yet a strong contender in several new and rapidly growing segments of the Internet economy that can drive significant job creation – Internet applications (Internet-related software, Web development and consulting) and e-commerce (business-to-business, business-to-consumer and intermediaries, such as brokers and portals).

### Exhibit 3: Canada's Current and Projected Share of World E-Commerce




Source:
IDC, 1999

### Exhibit 4: The Internet Economy

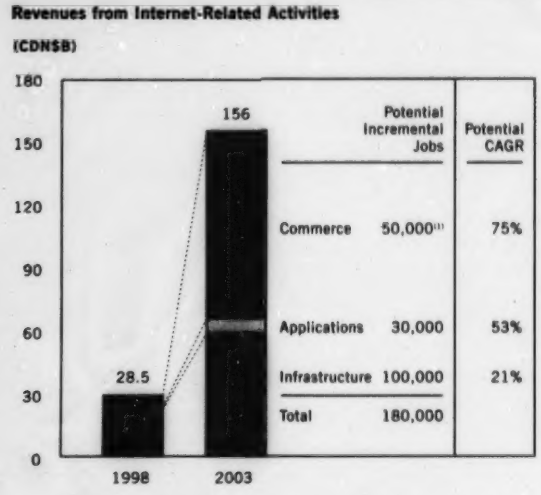
| | Estimated 1998 Internet Economy | | | | |
|---|---|---|---|---|---|
| | | | U.S. | Canada | Ratio of U.S./ Canada Revenue |
| Internet Economy Layer | Revenue (CDN$B) | Jobs | | | |
| **Electronic Commerce and Intermediaries**<br>• B2B[1], B2C<br>• Portals, brokers | 206.3 | 762,000 | | | 38x |
| **Internet Applications**<br>• Software development<br>• Web development and consulting | 83.5 | 408,000 | | | 100x |
| **Internet Infrastructure**<br>• Hardware<br>• Network software<br>• Internet access | 170.6 | 473,000 | | | 8x |
| **Total** | 414.4[2] | 1,478,000[2] | | | 15x |

Notes:
(1) Internet-based transactions only. Does not include EDI/VAN.
(2) Total does not equal sum because double counting between Commerce and other layers is factored out.

Source:
The Boston Consulting Group for Canadian data; University of Texas at Austin for U.S. data. See Appendix B for methodology.

[1] The Internet economy is made-up both of e-commerce revenues and the revenues of the companies that offer the products and services that make e-commerce possible. Revenues were converted to contribution to GDP at the rate of 2.2:1. For a description of the methodology used, see Appendix B. All figures in Canadian dollars.

## Exhibit 5: Potential Contribution of E-Business to the Canadian Economy




**If these growth rates could be achieved, e-business would drive incremental annual GDP growth of approximately 0.6%.**

**Note:**
(1) 80% of e-commerce jobs assumed cannibalized from bricks-and-mortar operations.

**Source:**
The Boston Consulting Group. See Appendix B for methodology.

### The New Online Intermediaries

**Commodities exchanges**, such as **Aribo** and **Metalsite**, facilitate the buying and selling of goods between a vast number of companies by standardizing the process and making it more efficient.

**Aggregators**, such as **Mercata** and **Accompany**, pool small quantity orders placed by individuals and companies in order to negotiate bulk purchase rates from manufacturers.

**Auction Sites**, such as **Bid.com** and **eBay**, facilitate the purchase and sale of a huge range of products and services directly between individuals in the form of an online auction.

**Clearing Houses**, such as **Priceline**, enable consumers to access discount prices by bidding for unsold time-sensitive inventory, such as airline tickets and hotel rooms.

This lag in high-growth, high-yield parts of the Internet economy raises genuine concerns about Canadian companies' eventual ability to compete against global Internet players. In the borderless Internet economy, many non-traded[2] service and retail sectors will suddenly find themselves competing against more nimble foreign Internet-based businesses. In the absence of convenient, cost-competitive, home-grown offerings, Canadian consumers and businesses will turn increasingly to alternatives outside of Canada for many products and services. The success of U.S. virtual book retailer Amazon.com with Canadian consumers is a telling example of how foreign online competitors can steal share in what has traditionally been a domestic market.

As the Internet changes the rules of competition, Canadian companies need to move quickly and aggressively to protect their home markets while expanding their geographic reach into new markets. But Canada is not moving fast enough on adoption and the creation of new e-businesses.

## POSITIONED FOR GLOBAL E-BUSINESS LEADERSHIP

With a strong infrastructure, high levels of Internet penetration, and early policy leadership internationally, Canada is well-positioned to accelerate its e-business leadership.

### Sophisticated Infrastructure

Canada is one of the most wired nations in the world. With all of its major cities well connected to a high speed backbone and the lowest Internet access costs among G7 countries (see Exhibit 6), the Internet is within reach of most Canadians.

Canada is also a leading research and development centre for Internet infrastructure. Nortel Networks, for example, is at the cutting edge of building high-performance Internet infrastructure and applications with innovations that increase speed, reliability, scalability and security. In addition, CANARIE, a not-for-profit organization working to accelerate Canada's advanced Internet development, has created some of the world's leading Internet-based research networks.

[2] Non-traded sectors are those in which companies compete solely with other companies in the same geographic or economic region. Traded sectors, in contrast, are those in which companies can draw new wealth into the regional economy through exports or by replacing imports.

### Highly Connected Population

In 1998, proportionately more Canadians accessed the Internet than did Americans. Moreover, those Canadian Internet users spent an average of 40% more hours online at home than did their American counterparts (see Exhibit 7). As with Automated Teller Machines (ATMs) and debit cards, Canadians have been quick to adopt Internet technology. Broadband access is also taking off in Canada, with widespread availability of high speed DSL and cable modem services.

### Progressive E-Commerce Policy

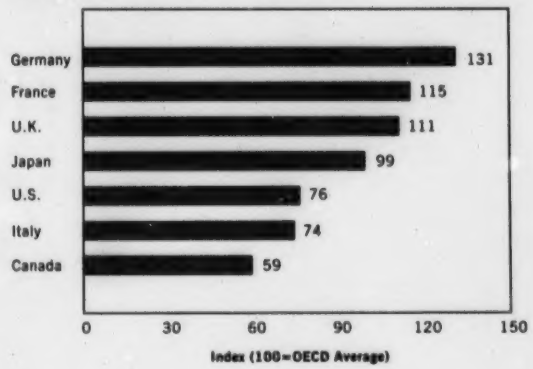
Canada enjoys a progressive policy environment for e-commerce. The Connecting Canadians agenda, with initiatives like SchoolNet and the Community Access Program, has succeeded in providing Internet access to every school[3] in Canada, as well as to public libraries and community centres. Canada has established a seven-point e-commerce framework that has gained international recognition, helping to create a strong brand for Canada as a leader in this area (see Exhibit 8).

These and other government initiatives fall under the broader *Canadian Electronic Commerce Strategy,* which articulates four themes: building trust in the digital marketplace, clarifying marketplace rules, strengthening information infrastructure, and realizing the opportunities. While Canada has made notable progress in the first three areas, Canada has been less successful so far in taking advantage of business opportunities and economic benefits of e-commerce.

**CANARIE's CA*Net3 is the world's first network designed exclusively to carry Internet data traffic rather than voice. Scheduled for completion in 2001, CA*Net3's bandwidth, the primary measure of speed, will be at least 40 gigabits per second, which is approximately sixteen times greater than the capacity planned for the fastest current U.S. initiative, the Abilene network.**

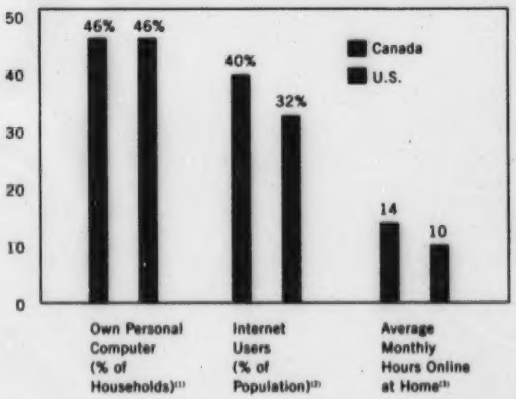
## Exhibit 6: Canada Ranks First Among G7 Countries for Internet Access Cost

**Telephone and Internet Access Charges, 1998**




**Source:**
OECD Communications Outlook, 1999. USD, PPP indexed to OECD average. Based on blend of 20 peak and 20 off peak hours online.

## Exhibit 7: Canada is at the Forefront of Adoption and Usage

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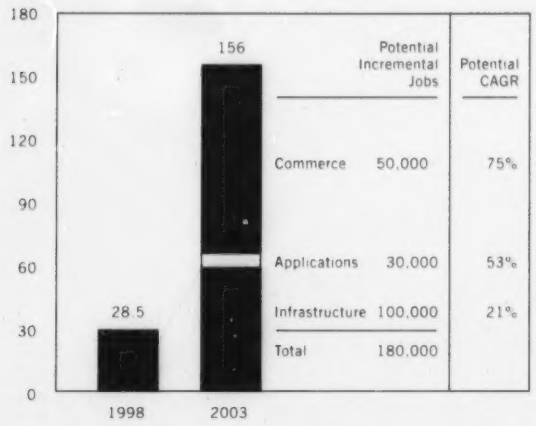
[3] To every school choosing to participate.

## Exhibit 5: Potential Contribution of E-Business to the Canadian Economy

**Revenues from Internet-Related Activities**

**(CDN$B)**




**If these growth rates could be achieved, e-business would drive incremental annual GDP growth of approximately 0.6%.**

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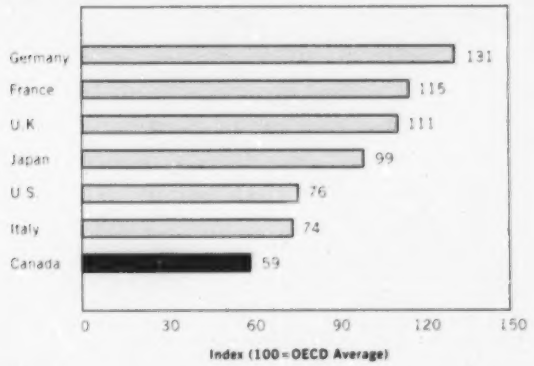


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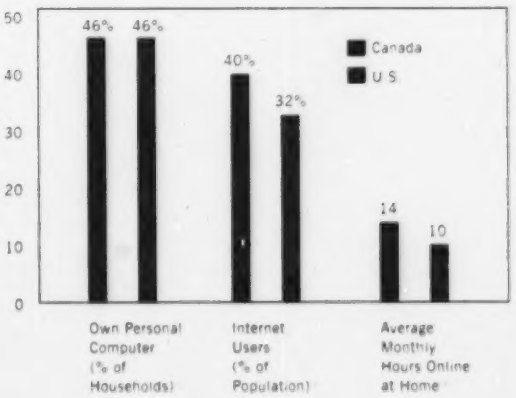


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[1] To every school choosing to participate.

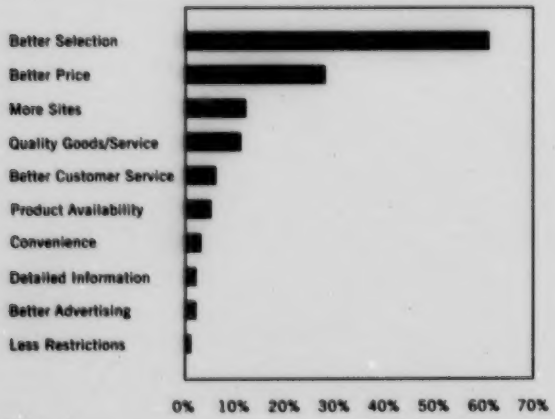
## Exhibit 8: Canada's E-Commerce Policy Framework

| | |
|---|---|
| | **Cryptography**<br>Policy allowing domestic use of any strength cryptography, no mandatory key recovery |
| | **Consumer Protection**<br>Voluntary business guidelines to protect consumers conducting online transactions |
| | **Privacy**<br>Framework legislation governing the protection of personal information(1) |
| | **Digital Signatures**<br>Legal framework for formal recognition of digital signatures and electronic records(1) |
| | **Government Use**<br>Policy framework for the Government of Canada public key infrastructure |
| | **Standards**<br>Domestic and international e-commerce standards framework |
| | **Tax Neutrality**<br>Commitment to technology-neutral e-commerce taxation regime |

**Source:**
Industry Canada

**Note:**
(1) Passage of legislation pending

## Exhibit 9: Top 10 Reasons Canadians Prefer to Shop at U.S. Sites




**Source:**
IDC data in IBM and Retail Council of Canada report, "e-Retail, The Race is On", 1999.
Multiple responses allowed.

## TRAILING THE UNITED STATES

Given Canada's infrastructure advantages, highly connected population, strong e-business policy framework, and the relative responsiveness of Canadians to the Internet, Canada has been surprisingly relatively slow to embrace e-commerce. In both business-to-consumer and business-to-business e-commerce, Canada trails the U.S.

### Business-to-Consumer E-Commerce

Canadian consumers are browsing but not yet buying as much online as their U.S. counterparts. While proportionately more Canadians than Americans use the Internet, Canadian users are less inclined to purchase goods and services online. In 1998, only 12% of Internet users in Canada had made at least one purchase online, whereas in the U.S. that figure was 39%.[4]

Like consumers elsewhere, Canadians are often reluctant to purchase online because of privacy and security fears. But there are other important deterrents. Canadians wishing to purchase from domestic online retailers have relatively few options, particularly in product categories that are already well established in the United States. Of the purchases Canadian consumers do make online, almost half are from sites in the U.S. and elsewhere – in spite of the fact that 82% of Canadian online shoppers always or sometimes look for Canadian sites.[5]

Along with greater choice in sites, Canadian consumers cite better selection and prices as the main reasons they shop online at U.S.-based sites (see Exhibit 9). All of this points to a supply-side deficit for Canadians in business-to-consumer e-commerce.

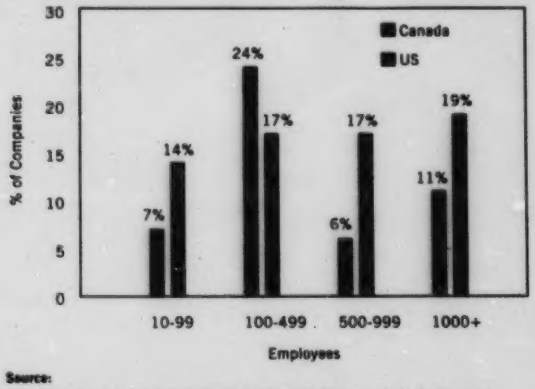
[4] IDC data in IBM and Retail Council of Canada report, "e-Retail, The Race is On", 1999
[5] Deloitte & Touche/Angus Reid online survey, November 1999

### Business-to-Business E-Commerce

Canadian businesses also trail their U.S. counterparts in e-commerce with fewer companies offering their products or services online (see Exhibit 10). In 1998, Canada's business-to-business e-commerce was less than 10% of the U.S. amount. IDC projections show this gap widening significantly, with Canada's business-to-business e-commerce estimated to be only 7.7% of U.S levels by 2003.[6]

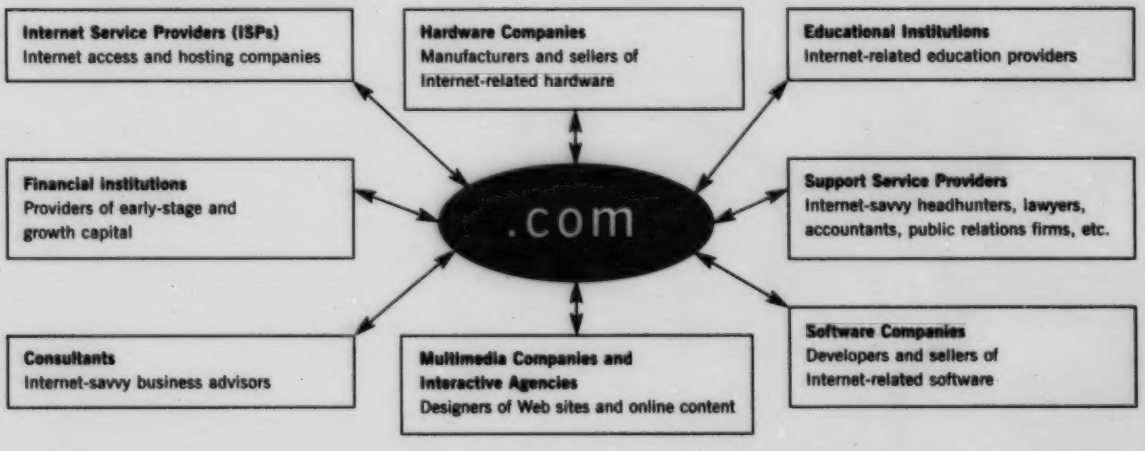
Companies with e-commerce capabilities drive the demand for products and services supplied by e-businesses at all stages of the Internet value chain, from hardware and network services to Web design, systems integration and interactive advertising (see Exhibit 11). If companies are slow to adopt the Internet, the myriad of product and service sub-sectors that supply to them will also face slow growth prospects.

### Exhibit 10: Companies Selling on the Internet, 1998




**Source:**
IDC, "Canadian Internet Commerce: A Comparative Analysis on the E-Commerce Activity of Canada and the U.S.", 1998

### Exhibit 11: Dot-Coms Fuel Growth of Broader E-Business Industry




[6] The Boston Consulting Group analysis based on IDC, "The Global Market Forecast for Internet Usage and Commerce," and "Internet Commerce in Canada, 1998-2003"

## Profiles: Some Canadian E-Commerce Leaders

***Online Banking and Trading*** • Canadian banks have been early leaders in offering online banking and discount brokerage services to their retail and small business customers. mbanx was one of the first full scale entries into online banking by a North American bank. TD Waterhouse is now the second largest online broker in North America, with a market capitalization of $9.9 billion.[i] Canada's discount brokerage industry captured an estimated $100 million in online revenues in 1998.[ii]

***Online Retailing*** • Online bookseller Chapters.ca has capitalized on consumers' frustrations with customs, duties, taxes and foreign exchange when ordering products from U.S. competitors. Chapters has demonstrated that Canadian retailers can take on the U.S. Internet giants with a competitive price and value offering and rapidly build a strong online brand. Indigo, Chapters' offline rival, has moved quickly to follow Chapters into the online space.

***Business-to-Business E-Commerce*** • Toronto-based GeoCommerce Inc., an IDS company, recently launched two e-commerce initiatives, MineOnline.com and GeophysicsOnline.com, designed to serve the international exploration and mining industry. The portals give mining, geophysics, and exploration professionals access to a common online marketplace for buying and selling equipment, services and geophysical data, as well as information on potential projects around the world.

***Promoting Adoption in Industry*** • In April 2000, the E-Commerce Council of Canada (ECCC), a not-for-profit voluntary standards organization, will launch Canada's largest online electronic catalogue service. Called ECCnet, the catalogue will ultimately include millions of products. It has the support of more than 19 industry associations in the grocery, drug, food service, general merchandise and apparel and health care sectors. The ECCC plans to extend the service to other industry sectors represented by its more than 30,000 company user base.

[i] As of 12/10/99
[ii] The Boston Consulting Group estimate based on research and industry interviews

## IVE OPPORTUNITIES FOR CANADA TO LEAD

/hile Canada cannot expect to be a leader in all segments f the Internet economy, it is well-positioned to achieve obal leadership in areas that play to its particular apabilities and strengths, such as the competitive skills f its labour force and a competitive cost structure environent. Highlighted below are five areas where Canada and anadian companies can aspire to global leadership.

**. Network Infrastructure**

anada's historical investments in leading-edge research in etwork technologies are evident today in the quality and readth of its Internet backbone, as well as the strong global osition its leading technology companies enjoy. Nortel etworks is the flagship Internet technology provider in anada and a global leader. Canada also has a growing adre of innovative new technology companies supplying the nternet, such as JDS/Uniphase and others clustered in the ttawa region. The continued rapid growth of these firms and eir progeny has established Canada as an important source f technologies that will accelerate the performance of nternet networks around the world.

**. Multimedia North**

s broadband capacity grows, the demand for animation and Veb-based graphics will explode. Canada is well-positioned o be a leading multimedia supplier. Canada's internationally nowned animation and design schools, such as Sheridan ollege in Oakville, have fed a growing multimedia industry ncompassing everything from Web design to graphic arts o video game development and have built a large labour rce of skilled technologists and engineers. Although this ultimedia sector has served the Canadian market primarily, can compete on skill and cost with design hotbeds in ew York City, San Francisco and Los Angeles. Companies uch as Toronto-based CYBERplex, for instance, are ggressively expanding into the broader North American arket and competing head-to-head with leading U.S. Veb development firms.

**. Global Customer Care Centres**

he Internet is creating a demand for a new type of call entre that integrates online and telephone solutions to ustomer service. Today's online customers want to click *and* all for service – often in real time and often in the language f their choice. This calls for a new type of customer support entre. Given the rapid decline in telecommunication costs, lobal call centres are now becoming feasible – if they can e staffed by sophisticated response teams with higher order echnical, language and service skills.

With its highly multicultural, multilingual population and technologically literate workforce, Canada is ideally suited to become a leader in global customer support centres for Internet-based businesses. Its sophisticated telecommunications infrastructure and ample experience in the call centre business[7] are factors that work in Canada's favour. And because these support functions can be provided remotely, many of these centres could be located in the Atlantic or Western regions of Canada.

As more Internet users want customer service in their own language, Canada's cosmopolitan labour force could be a significant competitive advantage. However, countries such as Ireland are targeting the same opportunity, focusing first on European call centres using imported labour with multiple language skills.

**4. Remote Service Provider**

Canada has mastered the delivery of services, such as health care and education, across its vast geography. Canada's experience in remote delivery of health care and education make these promising areas for extending existing services to global markets and for developing new programs or services that can be delivered over the Internet.

Extending these traditionally non-traded services to new markets would enable the export of this Canadian expertise. Within Canada, specialist services that were once inaccessible in remote regions could now be available all over the country. Canada already ranks second globally in the development of remote learning programs, with over 1,800 online courses already in place.[8]

**5. Web Tools Developer**

Many niche markets are still open to new dot-coms that Web-enhance the offerings of leading global Internet players. Canadian companies are creating and commercializing everything from navigation tools to site performance enhancers to new search technologies to payment solutions. One example is Montreal's Public Technology Multimédia, which has developed an innovative Web tool that allows customers of online apparel retailers to try on clothing virtually, using a three-dimensional image based on their personal measurements. Called MyVirtualModel, this Web tool is rapidly gaining acceptance among leading U.S. online retailers such as JCPenney and Lands' End.

Canada's call centre industry represented 220,000 agent positions in 1998. (PricewaterhouseCoopers)
"TeleCampus of TeleEducation NB" in *Information and Communication Technologies Economic and Statistical Information*, July 1999.

# STUMBLING BLOCKS FOR CANADIAN E-BUSINESSES

## TRANSFORMING EXISTING BUSINESSES

Several factors appear to be constraining existing Canadian businesses' abilities to realize the new opportunities offered by the Internet.

### Lack of Urgency

For many Canadian business leaders, the Internet is not yet a strategic priority. Some do not recognize e-business as a serious competitive threat, while others simply lack awareness of the opportunities. Canadian senior executives nevertheless acknowledge that their companies will soon become more reliant on e-commerce and that many of them are at risk of losing customers if they don't move online (see Exhibit 12).

Unless their leaders understand both the urgency and opportunity of e-commerce, Canadian companies will continue to fall behind their U.S. counterparts, who have made e-business a core element of their business strategies.

**Exhibit 12: How Canadian Executives Regard E-Commerce**

| | % Agree |
|---|---|
| "In 5 years my company will be more reliant on e-commerce" | 84% |
| "Exploiting the full potential of the Internet/developing e-commerce is a high priority" | |
| "Companies in my sector without e-commerce will be at risk of losing customers" | 67% |
| "E-commerce is a serious competitive threat to my company" | |

Source:
Andersen Consulting, 1999 eCommerce Survey of Canadian Business

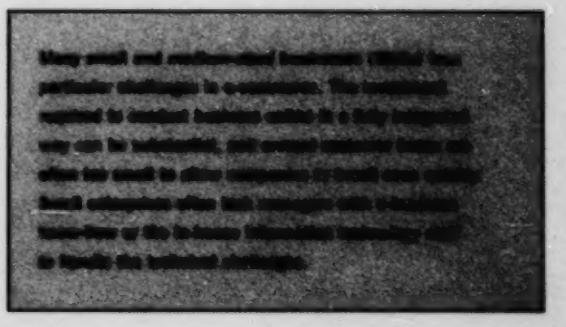
### Investment Decisions Based on Traditional ROI Models

Investments are traditionally evaluated in terms of expected gains in market share or revenues, or by potential cost savings. The Internet offers unprecedented opportunities to expand geographic reach and enter new markets. It can also deliver huge savings through efficiency gains in inventory reduction, shorter cycle times, and less manual administration. But these benefits can be hard to appreciate or measure, since e-commerce involves an entirely new way of doing business that is yet not fully understood or defined in many industries.

Many companies thus struggle to justify the potentially high up-front investment in e-business, using traditional, short-term cost benefit models. But this investment must be weighed against what could otherwise be lost in terms of both price realization and market share. What companies must consider is the potentially higher cost of *not* doing e-business.

### Limited Size of the Canadian Market

Successful Internet businesses can build scale rapidly by accessing a vast customer or supplier base, or by migrating large numbers of transactions online. Scalability has become extremely important, particularly for Internet startups that have the added challenge of investing to build a new brand. Achieving a return on e-business investment in a small market with a limited number of online customers is difficult when the competitors are large U.S.-based companies who are already beginning to gain economies of scale. For Canadian businesses to build scale quickly, they must leverage the broad reach of the Internet to move into larger markets or establish themselves in promising new niche markets.



# STUMBLING BLOCKS FOR CANADIAN E-BUSINESSES

## TRANSFORMING EXISTING BUSINESSES

Several factors appear to be constraining existing Canadian businesses' abilities to realize the new opportunities offered by the Internet.

### Lack of Urgency

For many Canadian business leaders, the Internet is not yet a strategic priority. Some do not recognize e-business as a serious competitive threat, while others simply lack awareness of the opportunities. Canadian senior executives nevertheless acknowledge that their companies will soon become more reliant on e-commerce and that many of them are at risk of losing customers if they don't move online (see Exhibit 12).

Unless their leaders understand both the urgency and opportunity of e-commerce, Canadian companies will continue to fall behind their U.S. counterparts, who have made e-business a core element of their business strategies.

**Exhibit 12: How Canadian Executives Regard E-Commerce**

| | % Agree |
|---|---|
| "In 5 years my company will be more reliant on e-commerce" | 84% |
| "Exploiting the full potential of the Internet/developing e-commerce is a high priority" | 29% |
| "Companies in my sector without e-commerce will be at risk of losing customers" | 67% |
| "E-commerce is a serious competitive threat to my company" | 21% |

**Source:**
Andersen Consulting, 1999 eCommerce Survey of Canadian Business

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**Many small and medium-sized businesses (SMEs) face particular challenges in e-commerce. The investment required to conduct business online in a fully integrated way can be substantial, and current customer bases are often too small to allow companies to break even quickly. Small enterprises often lack managers with e-business know-how or the in-house information technology staff to handle the technical challenges.**

**Shortage of IT Talent**

With at least 20,000 unfilled IT jobs in Canada, many Canadian companies lack the human resources needed to build e-businesses.[9] Not only are high calibre IT professionals in short supply, but many companies find the escalating cost of hiring or retaining IT professionals in Canada prohibitive. Canada's IT talent pool is under increased pressure due to an even more severe shortage in the United States. U.S.-based companies have stepped up their efforts to attract Canadian IT professionals by offering attractive opportunities, higher salaries and stock options in a lower tax environment.

**Border Providing False Sense of Security**

The Canada-U.S. border has traditionally protected some Canadian companies, particularly retailers, from U.S. competition. This remains the case in the early days of online retailing. Many online U.S. retailers will not ship to Canada, and for those that do, the combined cost of the product, exchange rate, shipping, customs duties and taxes can add up to a higher out-of-pocket expense for buying goods from U.S. sites. Rather than use this window of opportunity to establish themselves online before competition intensifies, many Canadian retailers have been slow to move.[10] As the Internet evolves and international policy is refined, barriers to cross-border fulfillment are likely to fall, thus exposing unprepared Canadian businesses to unprecedented levels of competition.

These challenges partially explain why existing Canadian companies have been slower than their U.S. counterparts to embrace the Internet fully. Together they contribute to a fundamental lack of both peer and supplier pressure to move online. The failure to address these challenges carries sizeable and potentially permanent risks for Canadian business.

## THE RISKS OF INERTIA

**Forfeiting First Mover Advantages**

Moving early gives companies a decided advantage in e-business. Being first, or at least early, often enables Internet competitors to capture and maintain a large share of the market. Followers become entangled in an ongoing game of catch-up and are forced to react to, rather than dictate the terms of competition.

**Competing at a Scale Disadvantage**

As the Internet tears down geographical barriers, smaller bricks-and-mortar companies are forced to compete locally for business against global Internet players with scale advantages. As these global players force prices down, offline small and medium-sized enterprises (SMEs) will not be able to compete on cost and will have to differentiate themselves by offering better service or speed.

**Getting Shut Out of Traditional Supply Relationships**

As online intermediaries emerge in business-to-business e-commerce and more large companies shift their procurement online, suppliers are at risk of being de-listed by or disintermediated from their customers. Particularly at risk are smaller suppliers, or those that can serve a limited geography. For instance, CIBC, with $1.3 billion in annual operations resource spending, recently announced its intention to migrate its purchasing to Ariba, an online intermediary based in the U.S. This is driving CIBC's current suppliers to be online and registered with Ariba in order to continue their business relationship with the bank.

**Missing Global Market Opportunities**

Canadian companies that remain offline are missing valuable opportunities to tap into global markets that once required an on-the-ground presence. For instance, today's Inuit art lovers from around the world can log on and buy pieces directly from Canadian-based galleries and artists. While enterprising vendors migrate online to boost their exports, those who are slow to move are forfeiting global growth opportunities.

[9] See www.itac.ca, IT Skills Gap

[10] Although 50% of top retailers in the U.S. conduct business online, the figure for Canada is just 26%, according to IBM and Retail Council of Canada, "e-Retail, The Race is On," June, 1999, which measured online activity of the top 50 retailers in Canada and the U.S.

## CULTIVATING NEW E-BUSINESS CLUSTERS

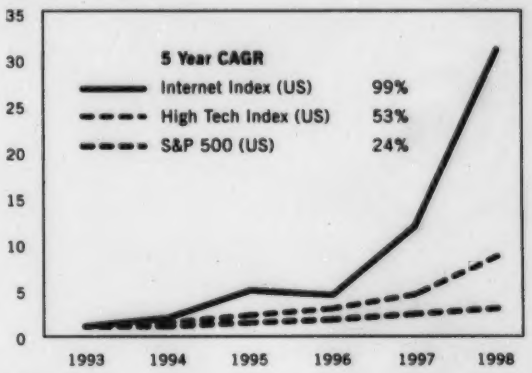
Moving existing Canadian businesses online is critical for developing a strong Internet economy. Equally critical is the spawning of new "dot-com" companies.

Many of these new players have rapidly created strong market positions and delivered significant shareholder value through skyrocketing market capitalizations (see Exhibit 13).

### Clusters as E-Business Catalysts

Most of the new e-business creation in the U.S. is occurring in specific regions where a set of key ingredients combine to fuel spectacular rates of new company formation. This new e-business formation is happening in clusters of activity in and around cities that are traditional high tech and media centres. The three most prominent clusters are found in the San Francisco Bay area (including Silicon Valley), New York City and Boston (see Exhibit 14).

### Exhibit 13: Total Shareholder Return of Internet Companies




Source:
The Boston Consulting Group

These e-business clusters have evolved organically; no two are from the same recipe. Although each cluster has been shaped by its unique history and circumstances, they share some characteristics and are descended from a similar set of catalysts. The ability of clusters to emerge and flourish depends on the presence of Internet-savvy, participative early-stage capital, strong research and educational institutions with active industry ties, and high tech anchor companies. Once established, the networking opportunities and technological synergies that these catalysts facilitate tend to result in a gravitation of IT talent and ideas to the area.

### Exhibit 14: E-Business Growth in U.S. Regional Clusters

| | Number of Internet Related Anchor Companies[1] | Domain Name Registrations (000s)[2] | Revenues of Top Technology Companies ($US B)[1] | Number of Interactive Media Firms[3] |
|---|---|---|---|---|
| **San Francisco Bay Area** | **62** | **69** | **104.1** | **181** |
| **New York** | **25** | **101** | **0.8** | **103** |
| **Boston** | **9** | **23** | **6.2** | **50** |
| Los Angeles | 12 | 43 | 0.1 | 226 |
| Washington | 6 | 21 | 2.7 | not ranked |
| Seattle | 2 | 27 | 14.8 | 41 |
| Austin | 2 | 22 | 15.2 | 22 |

Notes:
(1) A.T. Kearney and Joint Venture: Silicon Valley Network, "Internet Cluster Analysis" 1999. Anchor Companies are defined as large existing high-tech companies.
(2) Domains on Disc, as of April 1999, The Boston Consulting Group analysis
(3) A.T. Kearney, "San Francisco and the Future of Interactive Media," 1998

## Early-Stage Capital Providers

Clusters flourish in regions where there are early-stage capital providers who are Internet-savvy and take an active role in the development of a business idea. Prominent e-business venture capitalists such as Kleiner Perkins Caufield & Byers, Sequoia and Benchmark offer much more than just seed and growth funding. They are actively engaged in transforming ideas into thriving start-ups, and move quickly to create value and liquidity for shareholders through initial public offerings (IPOs).

## Exhibit 15: The Winning Formula of Leading Venture Capitalists

**Finding great entrepreneurs and ideas**

+

**Funding**
- Provide start-up through to pre-IPO funding
- Leverage links to investment banks and provide IPO support

+

**Management Expertise**
- Source key individuals on management team
- Install experienced and well connected executives on Board of Directors

+

**Strategic Resources**
- Introductions to Internet-savvy support service firms (legal, accounting, advertising, PR)
- Make technology and supplier recommendations

+

**Affiliates/Partnerships**
- Leverage stable of Internet start-up investments through affiliate relationships
- Create scale advantages by consolidating portfolio company needs across suppliers
- Venture capitalist's brand lends credibility critical to positive media coverage

**Source:**
The Boston Consulting Group analysis based on interviews and research

Leading venture capital firms often install experienced, Internet-savvy management in those new companies in which they invest. They are able to provide new companies with introductions to support service agencies that have e-business expertise and to potential business partners and customers (see Exhibit 15). Some early-stage capital providers 'incubate' companies by providing access to shared space and facilities, in addition to funding and management expertise. All of these activities combine to accelerate the start-up's growth.

### Few Sources of Participative Early-Stage Capital in Canada

Perhaps the most significant factor constraining home-grown Canadian e-business is the relative lack of Canadian-based, participative, early-stage capital prepared to invest in the "Internet space". Receiving backing from a venture capital firm can play a critical role in every aspect of developing a business, including how the market perceives the business model potential, the quality of its people and the ease with which good management and employees can be attracted, and how quickly the company can be established and selling to the market.

In Canada, the overall pool of venture capital is proportionately smaller than in the U.S., in part due to a deficit of institutional investors (see Exhibit 16). In an environment of multi-million dollar financings, Canadian deals are on average a fraction of the size of those in the U.S. (see Exhibit 17).

### Promising E-Venture Investors in Canada

Until recently there were few firms in Canada that were investing aggressively in the Internet space. But in the last year, several firms have raised significant funds that will be specifically targeted at developing Canadian e-businesses. Mosaic Venture Partners, McLean Watson Capital, Telsoft Ventures, Royal Bank Growth Corporation, XDL Capital, and Jefferson Partners have raised or are in the process of raising funds between $50 and $120 million each for Internet-related investments.

Another interesting development is the opening of Internet incubators, often owned and managed by these same venture capitalists, and modeled on the success of U.S. players like Idealab! Toronto now boasts a handful of these incubators, such as exclamation!, Yorkton Securities' Ecom Park, The NRG Factory, and Brightspark. These facilities combine capital with access to office space and a set of shared administrative services, including telecom, legal and accounting advice.

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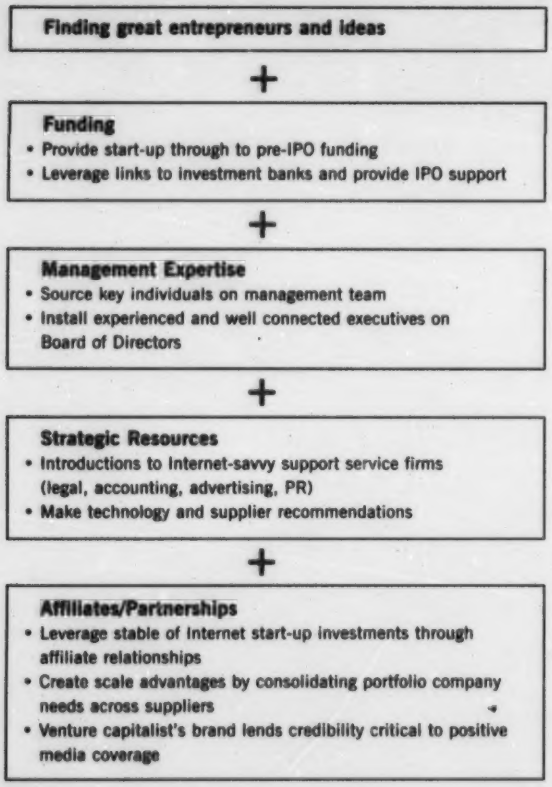
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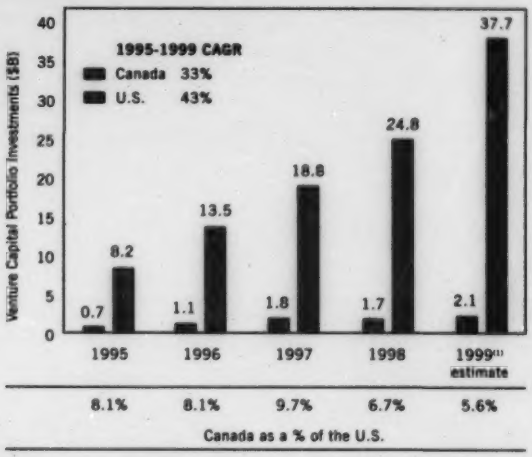
## Exhibit 16: Canadian Venture Capital Growth Relative to the U.S.



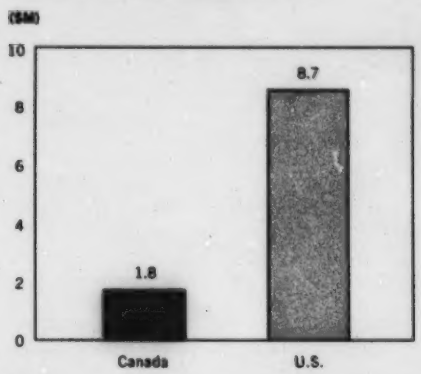

**Note:**
(1) Estimates based on Q1 and Q2 1999 results

**Source:**
Macdonald & Associates Ltd., Canadian Venture Capital Association 1999 Statistical Review; Venture Economics, 1999 National Venture Capital Association Yearbook

The environment is less dynamic in Canada because the venture capital market here is dominated by passive and semi-public investors. Labour-sponsored funds, government funds and hybrid funds – none of which is permitted to take a large ownership stake in the companies in which it invests – make up over 60% of the Canadian venture capital pool. In contrast, only 1% of U.S. funds are under management by non-private investors (see Exhibit 18).

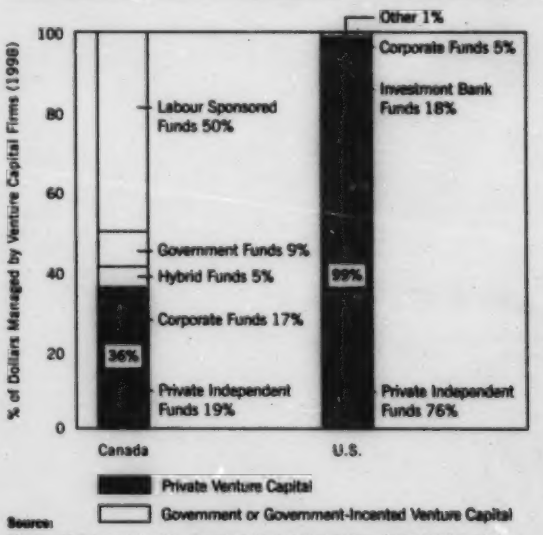
Privately managed funds generally have aggressive target returns (greater than 30%) and, consequently, play a very active role in directing the companies in which they invest, through participation on company boards and playing an active role in sourcing key management. In comparison, investors in government-incented labour sponsored funds receive a return in the form of an up-front tax credit and as a result have tended to be less demanding of high returns on the funds themselves.

## Exhibit 17: Size of Venture Capital Deals in Canada vs. the U.S.



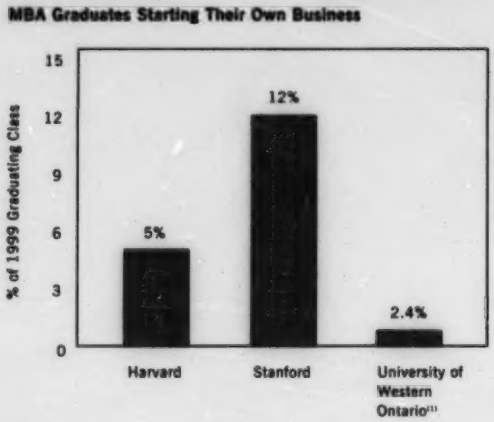

**Source:**
The Boston Consulting Group estimates based on data from Macdonald & Associates Ltd., Canadian Venture Capital Association 1999 Statistical Review; Venture Economics, 1999 National Venture Capital Association Yearbook

## Exhibit 18: Predominance of Government and Government-Incented Funds in Canada




**Source:**
Macdonald & Associates Ltd., Canadian Venture Capital Association 1999 Statistical Review; Venture Economics, 1999 National Venture Capital Association Yearbook

## Exhibit 19: U.S. MBA Graduates Aggressively Pursuing New Business Opportunities




Note:
(1) Includes graduates joining family businesses

Source:
Harvard Business School, Stanford Graduate School of Business and Richard Ivey School of Business placement reports

## Strong Research and Educational Institutions with Active Industry Ties

Another catalyst to e-business cluster development is the presence of strong educational institutions that attract, educate and inspire potential e-business creators, while facilitating e-business research and innovation.

Schools such as Harvard and MIT in Boston and Stanford in San Francisco play an active role, not only in educating Internet professionals, but in the very creation of new e-businesses. Faculty and graduate students work closely with the private sector in a consulting or research capacity and in commercializing marketable research. In turn, the private sector is engaged in curricula development and teaching. This inside-out, outside-in connection builds a strong and self-reinforcing network of knowledge and contacts, all of which fosters new e-business creation.

Many graduates of top business schools in these clusters are now choosing to start their own companies instead of following more traditional paths (see Exhibit 19). At Stanford's Graduate School of Business, for example, 21 new companies were formed by graduates of the 1999 class.[11] An increasing number of MBA graduates (27% at Harvard) are choosing to accept positions with small companies and start-ups.[12]

### Weaker Linkages in Canada

In Canada, the emergence in the Ottawa region of a Silicon Valley North was enabled largely by the co-location and collaboration of high tech industries and research communities. But there are few examples of successful cluster activity in the rest of Canada because the linkages among universities, business and the financial community are generally not as strong or as focused as in the U.S. The factors that create tight linkages – directed research and cross-pollination among university faculty and business management and technology staff, and active early-stage venture capitalists – are infrequent and too sub-scale to drive new business creation.

Not every emerging Canadian e-business cluster has strong university ties or a strong focus on high tech and Internet-related business creation. With a few exceptions, business and engineering programs at Canadian post-secondary institutions place little emphasis on entrepreneurship and new business creation. Furthermore, Canadian universities do not always fully exploit their pool of successful entrepreneurial alumni to teach, mentor or develop course curricula.

[11] The Boston Consulting Group Interviews
[12] Harvard Business School 1999 MBA Placement Report

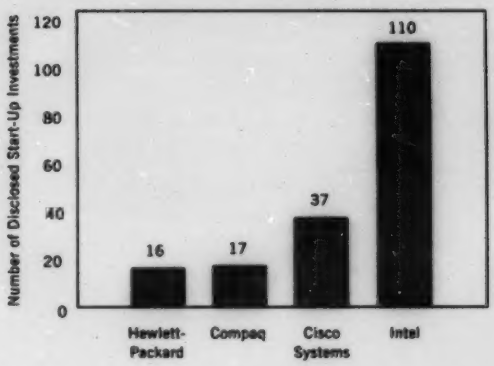
## High Tech Anchor Companies

The presence of large, established high tech companies helps attract the brightest IT talent, both technical and creative, and fosters training and development. Many of these anchor companies also actively encourage and invest in spin-off companies (see Exhibit 20).

Anchor companies further feed new e-businesses by becoming their major customers and by fuelling the market for support service agencies that specialize in serving e-businesses.

### Exhibit 20: Anchor Companies Investing in IT Start-ups

**Direct Investments from San Francisco Bay Area Companies in IT Start-ups (1992-1998)**




**Source:**
*VentureEdge*, Summer 1999. Published by VentureOne

### Fewer Anchor Companies in Canada

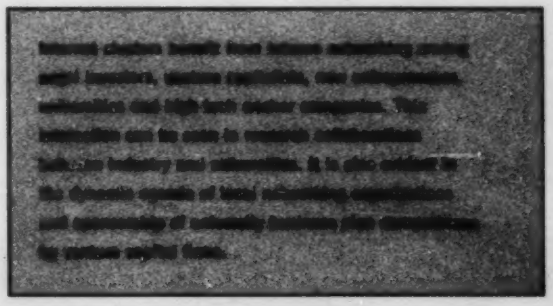
Canada has some strong anchor companies in the high tech sector. Nortel Networks, having spun-off 55 high tech companies in Canada, has an impressive track record for creating and investing in new companies. The Newbridge Networks Affiliates program, which invests in young companies that are developing technologies that complement Newbridge's, is largely responsible for a budding cluster around Kanata. However, corporate venturing of this kind is not embedded in most Canadian companies' business strategies. Beyond the examples cited above, Canada lacks the critical mass of anchor companies in any given geography necessary to spawn a large group of satellite companies.

## Reinforcing Cluster Formation

Other stakeholder groups also play reinforcing roles in cluster formation in each region:

***Internet-focused support service agencies*** – Internet-savvy law and accounting firms, advertising agencies and headhunters can all play a role in fostering ongoing e-business cluster development. In New York City, for example, leading advertising agencies are creating interactive media divisions to develop online strategies for traditional clients. These agencies also feed creative talent into Internet start-ups. Many support service agencies are adopting a work-for-equity model that offers greater potential rewards for themselves and frees valuable start-up capital for their clients.

***Active industry associations*** – In Boston, for example, the Massachusetts E-Commerce Association holds regular workshops and informal gatherings, actively liaises with local press to promote coverage of their membership and conducts an annual awards ceremony to recognize the ten most influential and innovative e-business leaders in the region. All of these activities foster and build awareness of the region's e-business community.



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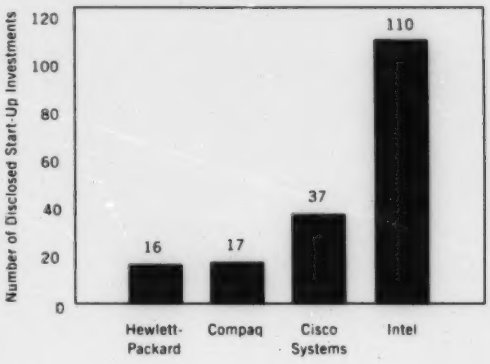


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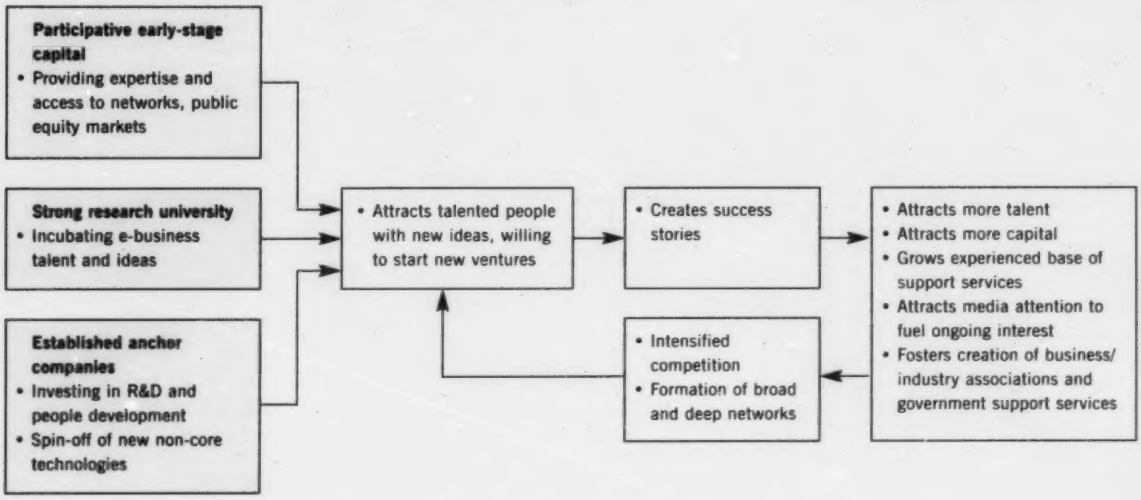
**Internet clusters benefit from intense networking among angel investors, venture capitalists, new entrepreneurs, universities and high tech anchor companies. This interaction can be seen in research collaborations between industry and universities. It is also evident in the dynamic agenda of local networking organizations and sponsorship of university business plan competitions by venture capital firms.**

***Early stage assistance at the local level*** – Supporting entrepreneurship is the cornerstone of the City of Cambridge (Mass.) economic development strategy. The city invests US$5 million of city pension funds in new start-ups, provides aspiring entrepreneurs with one-on-one assistance in developing business plans and offers workshops on incorporating, building a marketing plan and assessing capital requirements. In addition, they sponsor a monthly "Breakfast with the Stars" program in which seasoned entrepreneurs share their experiences with young entrepreneurs. As well, a mentorship forum brings together young CEOs from non-competing companies with a more experienced mentor to exchange ideas and offer advice.

***Focused media interest*** – In the San Francisco Bay area, specialty publications such as *The Industry Standard, Business 2.0* and *Red Herring* focus exclusively on e-business. These publications help build interest, create heroes and permit transparency among competitors.

Together, these factors fuel the formation and rapid expansion of an e-business cluster. Once established, cluster development becomes a self-perpetuating cycle for accelerating e-business growth (see Exhibit 21).

## Exhibit 21: The Cycle of E-Business Cluster Growth


Participative early-stage capital
• Providing expertise and access to networks, public equity markets
Strong research university
• Incubating e-business talent and ideas
Established anchor companies
• Investing in R&D and people development
• Spin-off of new non-core technologies
• Attracts talented people with new ideas, willing to start new ventures
• Creates success stories
• Attracts more talent
• Attracts more capital
• Grows experienced base of support services
• Attracts media attention to fuel ongoing interest
• Fosters creation of business/ industry associations and government support services
• Intensified competition
• Formation of broad and deep networks

**Source:**
The Boston Consulting Group analysis based on interviews and research of successful U.S. clusters

## BARRIERS TO E-BUSINESS IN CANADA

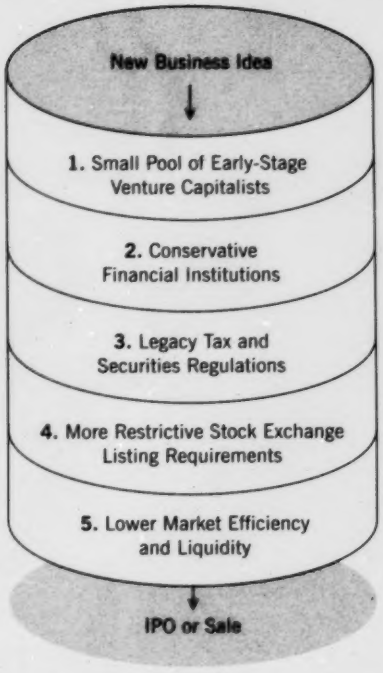
Canada too has its emerging e-business clusters, particularly around Ottawa, Toronto, Waterloo, Montreal, Calgary and Vancouver. Each area boasts its own set of fast growth start-up companies, offshoots of universities or strong local anchor companies. However, Canadian start-ups in all geographies face a set of common challenges in gaining access to financing, and attracting and retaining talent. Many of the obstacles to developing homegrown Canadian e-business clusters are related to the risk/reward equation that investors, entrepreneurs and start-up management must consider when deciding where to locate their investment or new enterprise.

### Bottlenecks in the IPO Pipeline

Success for any venture capitalist is measured by the ability to cash out of an investment on a timely basis at an attractive return. Canada's venture capitalists face various barriers and impediments compared to their U.S. counterparts in pursuing an exit strategy. Together these impediments make it difficult to take an e-business idea the full distance along the pipeline to an Initial Public Offering (IPO) or sale in Canada (see Exhibit 22).

Canadian investment banks are less focused on Internet deals than is the case with their major U.S. counterparts. Between January 1, 1998 and June 30, 1999, the four Tier 1 investment banks in Canada completed only two Internet deals, compared with 204 in the U.S.[13] The IPO market also reflects this disparity: there were only four Internet-related IPOs on the TSE during 1999, compared to 165 on Nasdaq.[14]

**Exhibit 22: Five Factors Impeding the Pipeline to IPO or Sale for New Canadian Businesses**


New Business Idea
1. Small Pool of Early-Stage Venture Capitalists
2. Conservative Financial Institutions
3. Legacy Tax and Securities Regulations
4. More Restrictive Stock Exchange Listing Requirements
5. Lower Market Efficiency and Liquidity
IPO or Sale

**Source:**
The Boston Consulting Group analysis based on interviews and research

| Internet-related IPOs in 1999: | |
|---|---|
| **TSE** | **4** ***(2 cross-listed on U.S. exchanges)*** |
| **Nasdaq** | **165** |

[13] Canadian investment banks: CIBC Wood Gundy, RBC Dominion Securities, BMO Nesbitt Burns, Scotia Capital Markets; U.S. investment banks: Goldman Sachs, Morgan Stanley/Dean Witter, Merrill Lynch, Salomon Smith Barney.

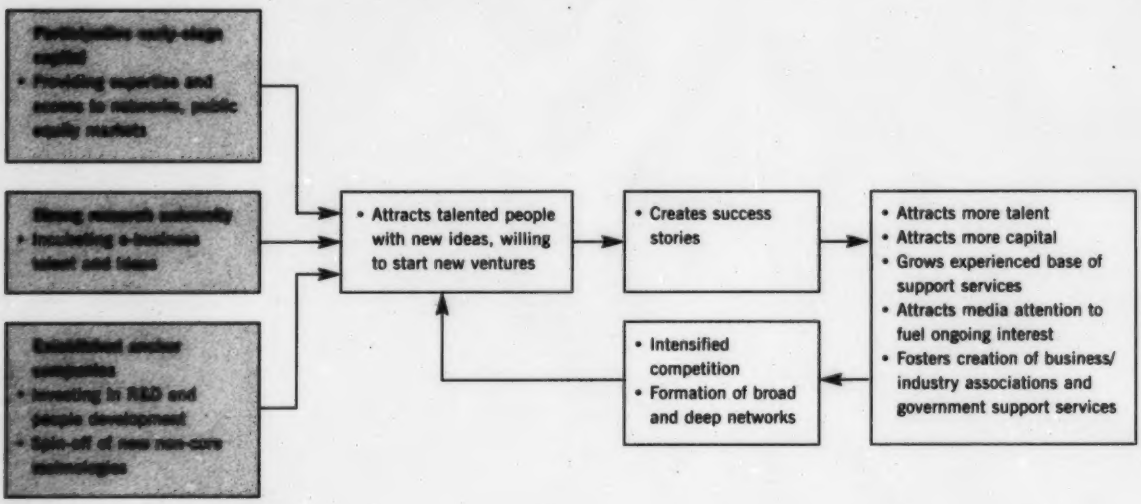
[14] The Boston Consulting Group analysis based on Securities Data Company data and interviews. During the same period there were three Internet-related IPOs on the Canadian Venture Exchange (and its predecessors).

***Early stage assistance at the local level*** – Supporting entrepreneurship is the cornerstone of the City of Cambridge (Mass.) economic development strategy. The city invests US$5 million of city pension funds in new start-ups, provides aspiring entrepreneurs with one-on-one assistance in developing business plans and offers workshops on incorporating, building a marketing plan and assessing capital requirements. In addition, they sponsor a monthly "Breakfast with the Stars" program in which seasoned entrepreneurs share their experiences with young entrepreneurs. As well, a mentorship forum brings together young CEOs from non-competing companies with a more experienced mentor to exchange ideas and offer advice.

***Focused media interest*** – In the San Francisco Bay area, specialty publications such as *The Industry Standard, Business 2.0* and *Red Herring* focus exclusively on e-business. These publications help build interest, create heroes and permit transparency among competitors.

Together, these factors fuel the formation and rapid expansion of an e-business cluster. Once established, cluster development becomes a self-perpetuating cycle for accelerating e-business growth (see Exhibit 21).

**Exhibit 21: The Cycle of E-Business Cluster Growth**


• Attracts talented people with new ideas, willing to start new ventures
• Creates success stories
• Attracts more talent
• Attracts more capital
• Grows experienced base of support services
• Attracts media attention to fuel ongoing interest
• Fosters creation of business/ industry associations and government support services
• Intensified competition
• Formation of broad and deep networks

**Source:**
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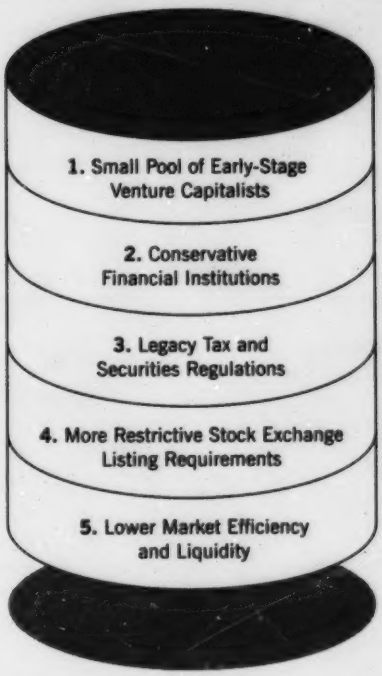
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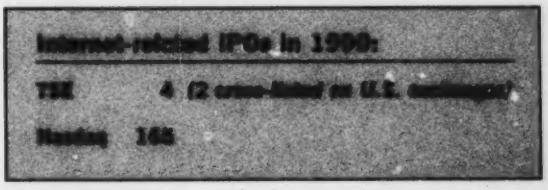


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## Made in Canada, Moved to the U.S.

The challenges in accessing early-stage financing in Canada has driven the loss of some potential Internet powerhouses to the U.S.

***Accompany*** is an Internet-based buying network that coordinates demand for products and services in real time. Accompany provides both consumers and small businesses with the purchasing advantage that large organizations traditionally enjoyed by consolidating their orders. Founded by two Canadians and one American, the firm located its head office and sourced venture capital in San Francisco.

***HomeGrocer.com*** is an online grocery store that delivers directly to customers' homes. Unable to secure financing in Canada, the founders relocated to Washington. There they secured more than US$160 million in pre-IPO financing, including more than US$50 million from Amazon.com.

***Photopoint***, the world's largest free photo Web site, lets members post and organize photographs online so that friends and family from around the world can view them. Originally based in Halifax, Nova Scotia and Kitchener, Ontario, the head office was relocated to San Francisco upon receiving financing from three U.S.-based venture capitalists.

Canada's scale and relative market size put Canadian investment banks at a disadvantage in terms of their ability to provide dedicated analyst coverage, and to create and track e-business indices. Ultimately, this translates into a lower comfort level with e-business investments that drives a more conservative approach and lower valuation multiples.

Similarly, Canadian pension funds have been less inclined to allocate capital to higher risk asset classes than in the U.S., with a few notable exceptions, such as Quebec's Caisse de Depot. In 1998, just 6% of the total dollars raised by Canadian venture capital funds came from pension funds, whereas in the U.S. the figure was 60%.[15]

### Legacy Tax and Regulatory Treatment

Several aspects of current tax and securities regulations create significant barriers to early-stage capital formation on a large scale in Canada and inhibit the process of taking companies through to initial public offering. Given the increasing mobility of money, talent and ideas, this is a critical issue if Canada is to develop a vibrant Internet economy.

***Capital gains treatment*** – The pool of Canadian early-stage venture capital is also affected by capital gains treatment. American venture capitalists in certain jurisdictions can transfer funds from one qualified investment to another while deferring payment of capital gains tax. This has a significant impact on the size of the invested capital base. Moreover, overall capital gains rates in Canada are in some cases close to double those of the U.S. – that is, up to 39% in Canada versus 20% in the U.S.

***Resale restrictions and escrow requirements*** – In general, a shareholder in a U.S. company (who is not affiliated with that company) who acquired shares prior to an initial public offering and has held those shares for more than two years can trade them without any resale restrictions within three months of an initial public offering. In contrast, Canadian securities laws generally require that shareholders who acquired shares prior to an initial public offering will not be able to trade those shares without resale restrictions until at least twelve months have elapsed from the date of an initial public offering. In addition to these resale restrictions, securities laws and stock exchanges in Canada in many cases will require founding investors such as venture capital firms to hold a portion of their shares in the relevant company for a prescribed period of time, which may be as long as six years from the date of an initial public offering. There are no similar requirements in the U.S. It is common practice in both Canada and the U.S., however, for underwriters in an initial public offering to make it a condition of their participation on the significant shareholders entering into a lock-up agreement pursuant to which such shareholders agree not to begin to sell any of their shares for an agreed period of time after the initial public offering (typically 180 days).

The availability to venture capital firms of this earlier exit mechanism in the U.S. creates a powerful incentive for venture capital firms to take companies public in the U.S. and not in Canada.

[15] Macdonald & Associates Ltd. in Ventures West, The Private Equity Analyst, 1999 Global Investing Conference, Venture Capital in Canada, Venture Economics, 1999 National Venture Capital Association Yearbook

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***Attracting capital from foreign investors*** – Private venture capitalists in Canada have tried to expand the available pool by attracting capital from foreign investors into Canadian venture capital funds, but their ability to do so has been constrained by current tax regulation. Currently, foreign investors who pool their funds as part of a limited liability company (LLP) in the U.S. do not qualify for tax treaty treatment, and therefore are subject to the higher capital gains tax rates that apply to residents of Canada. The difference in respective capital gains tax rates between the two countries makes it very difficult for Canadian venture capitalists to raise funds from U.S. investors, despite their availability and interest.

***Barriers to merging with foreign firms*** – In the dynamic environment of the technology industry, one of the keys to a company's success can be its ability to seize new business opportunities through mergers and acquisitions. Share-for-share mergers with larger U.S. and other foreign companies also represent important exit strategies for entrepreneurs and their early-stage investors. However, current Canadian tax rules provide that when a Canadian company merges with a foreign company by its shareholders exchanging their shares for shares of an equivalent value in the foreign company, a current cash tax liability is immediately triggered for those Canadian company shareholders, even though they will have no cash proceeds to pay for their shares. Frequently, the Canadian shareholders are unable to sell their shares to pay tax even if they wish to do so, as a result of escrow requirements, contractual lock-up agreements or where the U.S. merger partner is a private company whose shares are not publicly traded. This puts the Canadian entrepreneur and start-up management at a disadvantage in their growth and development, since it is very difficult for Canadian companies to complete these types of share-for-share merger transactions with U.S. and other foreign partners. It is easier for many new companies to move south and establish themselves initially as U.S. companies to compete on a level playing field against their U.S. competitors.

When Canadians complete share-for-share mergers with Canadian merger partners, a tax rollover is available to the Canadian shareholders, who do not incur a tax liability until they actually sell their post-merger shares for cash proceeds. Even where a cross-border merger may be structured to achieve a tax rollover, these become very complicated transactions involving significant additional time and expense.

**Less Dynamic Capital Market Environment**

Even if a company makes it to the stage of going public in Canada, listing requirements for the Toronto Stock Exchange (TSE) are relatively restrictive. The trend internationally is for Internet companies to go public very early to attract the required capital to gain scale and to capitalize on attractive valuations. The TSE currently requires firms to have both tangible assets and evidence of pre-tax income, which many e-businesses lack at the time of an offering. In contrast, Nasdaq allows companies to list on the basis of the potential for a US$50 million market capitalization, even in the absence of profits.

Once public on the TSE, the relative lack of liquidity in Canada prevents companies from attaining the valuation multiples that many U.S.-based players are able to sustain. Differences in accounting principles between Canada and the U.S. also create uncertainty for U.S.-based investors, which can translate into a discount being applied to Canadian stocks.

The newly formed Canadian Venture Exchange offers the opportunity to resolve some of these issues and become the home to Canada's newly emerging dot-coms and fast growth high tech companies. But some of the same challenges remain, including substantially lower liquidity than on Nasdaq.

These factors are prompting the Canadian investment community to push Canadian companies to go public in the U.S., bypassing Canadian exchanges altogether. Many start-ups begin as U.S. incorporated companies with Canadian operations instead of Canadian incorporated companies to avoid these potential complications.

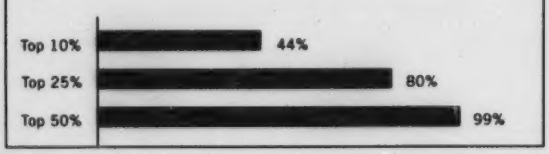
## Attracting and Retaining E-Business Talent

The talent required to run an e-business is scarce across North America. This includes the IT talent that is responsible for coding, building and maintaining Web sites and systems, and designing new hardware and software. It also includes the research talent that develops new technologies, applications and business ideas and the experienced start-up management talent that can capitalize on these new ideas. Compounding the challenge for Canada is the competition from the United States for IT professionals and skilled managerial talent.

A growing number of emigrants to the United States represent Canada's best and brightest graduates, with over 40 percent of them coming from the top 10 percent of their class and 80 percent being in the top quartile (see Exhibit 23).

**Exhibit 23: Canada is Losing its Best and Brightest to the U.S.**

| | Graduates Who Moved to the U.S. | % of all Graduates |
|---|---|---|
| College | 1,162 | 1.4 |
| Bachelor | 2,376 | 1.7 |
| Master | 683 | 3.2 |
| Doctorate | 359 | 12.0 |
| Total | 4,636 | 1.5 |




Source:
Statistics Canada, Class of '95

This exodus to the U.S. appears to be driven by three major factors: opportunities, salaries and taxation.

***Opportunities*** – The size and dynamism of the U.S. economy enables U.S. firms to offer a greater variety of employment opportunities to Canadian graduates. Often these companies are far more aggressive in their recruiting efforts than Canadian companies.

***Salaries*** – Salaries for knowledge workers and managers in the U.S. also outstrip those in Canada. Highly skilled Canadian workers are earning up to 26 percent less than their U.S. counterparts, even on a purchasing power parity basis (see Exhibit 24).

***Taxation*** – Canadian e-businesses have a hard time competing with U.S. firms, even when using equity incentives to retain and motivate Canadian knowledge workers. Stock options now figure routinely and prominently in high tech compensation packages, thus giving workers a strong ownership stake in building the company, at minimal initial cost to the company.

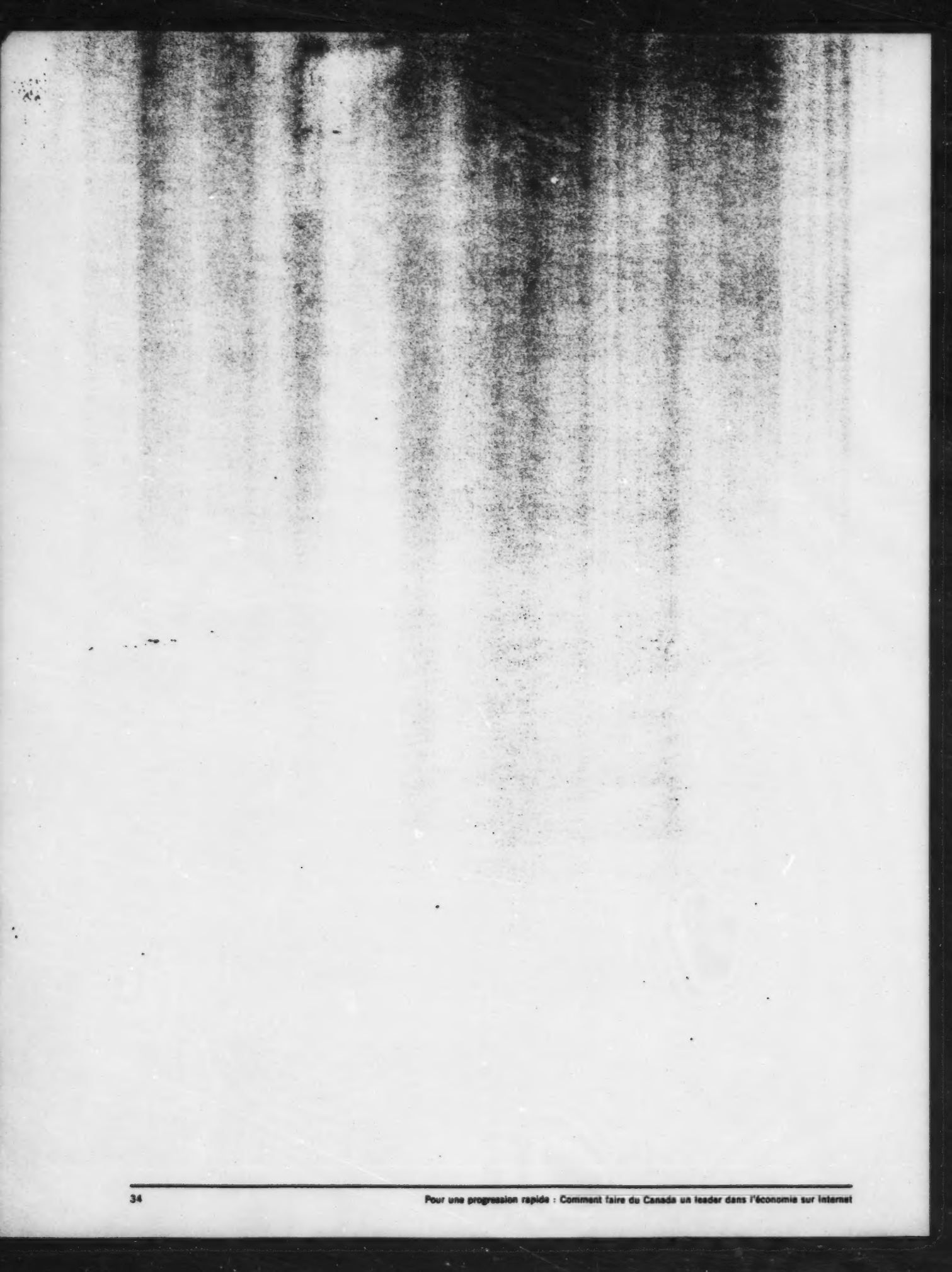
The retention power of stock options in Canada is constrained by their less attractive tax treatment. In particular, in Canada stock options are generally taxed when exercised as opposed to when the option shares are sold, eliminating significant tax deferral advantages for employees. In the U.S., companies have the ability to provide stock options where the benefit is taxed only when the shares are sold, not when the option is exercised.

## Exhibit 24: U.S. Companies Offer Higher Salaries

| | 1999 Salaries (PPP)[1] | | |
|---|---|---|---|
| | Canada (CDN$) | U.S. (CDN$) | Canada as % of U.S. |
| **Entry Level** | | | |
| Web Architect | $ 38,157 | $ 51,243 | 74% |
| Programmer/Analyst | 47,898 | 59,078 | 81% |
| Systems Design Engineer | 39,567 | 49,820 | 79% |
| Software Developer | 41,461 | 56,310 | 74% |
| Systems Analyst | 54,381 | 68,286 | 80% |
| **Manager** | | | |
| Web Content Manager | 54,611 | 69,694 | 78% |
| Software Development Manager | 78,065 | 100,144 | 78% |

**Note:**
(1) U.S. salaries adjusted at purchasing power parity (PPP) rate of US$1 = C$1.25

**Source:**
Personnel Systems and Software Human Resource Council report, "Salary Increases, 1997-1999 – Informatics Occupational Skills Stream"



# BUILDING BLOCKS FOR CANADIAN E-BUSINESS LEADERSHIP

## ACCELERATING CANADA'S E-BUSINESS LEADERSHIP

Despite the challenges that Canada faces, we are in fact starting from a position of strength in e-business – arguably second only to the U.S. Canada is well-positioned to capitalize on the many untapped opportunities of the Internet economy, and to become a global leader in certain areas.

Among G7 countries, Canada is poised to lead in many segments of the Internet economy, thanks to a strong IT sector, a diverse, multilingual population, excellent engineering, technology and design education, and a tradition of collaborative development and rapid technological adoption in important sectors such as financial services. Our relative ease of access to and knowledge of the North American market enables Canadian companies to build scale by moving beyond the Canadian market with their products and services. But Canada urgently needs to set and meet ambitious goals to achieve this leadership. With that in mind, the Roundtable has articulated the following vision for propelling Canada to the forefront of the Internet economy:

> ***To establish Canada as a globally recognized e-business leader to promote a higher quality of life for our citizens through economic growth, job creation and more convenient access to information, goods and services.***

Realizing this vision will require building awareness, at home and abroad, both of the opportunity for Canada and of our strengths. This will not be easy. Canada's e-business achievements, though significant, have been overshadowed by the massive outpouring of business success stories emanating from a powerful U.S.-focused media. Furthermore, Canada's "brand" internationally has been traditionally that of a country rich in natural resources, not that of a skilled high tech exporter.

The major stakeholder groups that can drive the development of Canada's Internet economy are leaders in business and industry associations, finance, educational institutions and governments.

## DRIVING CANADA'S INTERNET ECONOMY: STAKEHOLDERS AND ROLES

**Business Leaders/Associations**

- Become visible champions for e-business development in Canada
- Influence and educate customers and suppliers
- Forge links with universities to foster talent development and research
- Facilitate the development of industry-wide e-business standards and practices within specific sectors

**Financial Community**

- Invest to develop deeper expertise in technology and e-business sectors
- Forge partnerships with U.S.-based funds to access expertise and networks
- Build linkages with universities to gain access to ideas and talent
- Work with regulators to address capital market barriers

**Educators**

- Prioritize programs to develop future e-business entrepreneurs and managers
- Engage the private sector and financial community in the development of curricula, research and creation of opportunities for graduates
- Adopt the International Computer Driving License as a prerequisite for graduation to drive Internet literacy

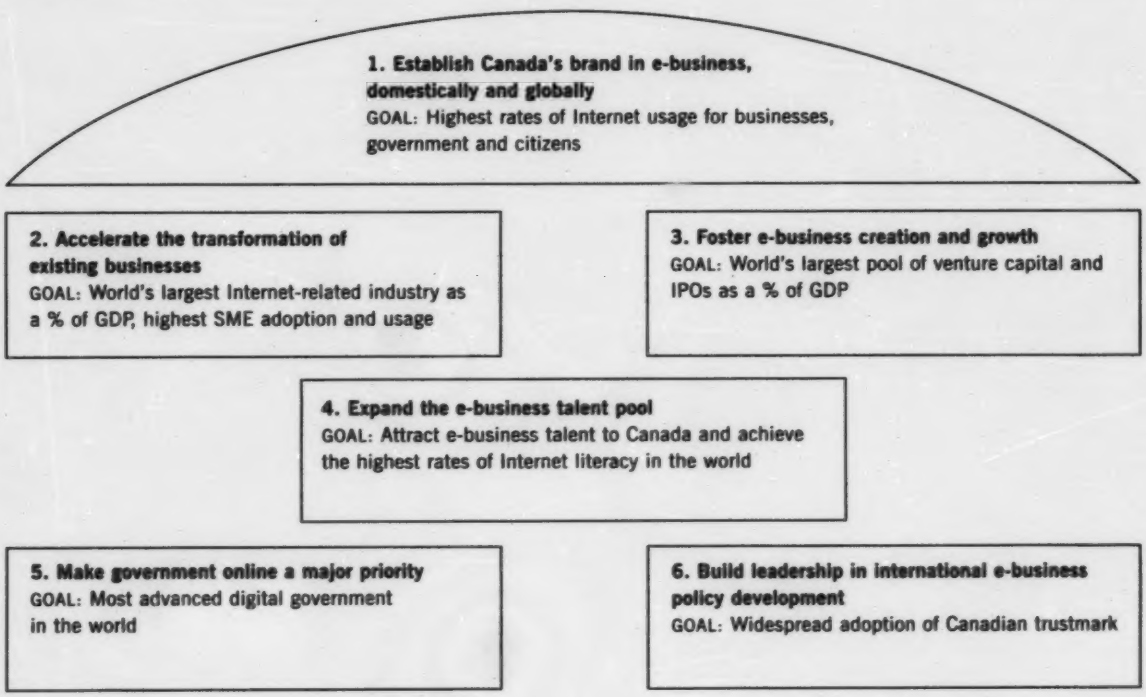
**Governments**

- Pursue strategies to support Canada's emerging clusters, such as attracting investment by foreign anchor companies
- Move quickly to make government online a priority, with visible leadership, targets and timelines
- Focus available resources on programs and tools to help businesses transform, particularly small and medium-sized businesses
- Provide greater incentives for e-business entrepreneurs to build companies in Canada
  - Defer taxation of stock option benefits to the time of sale of the redeemed shares
  - Extend small business capital gains tax exemptions to employees of Internet start-ups
- Take steps to level the capital markets playing field for Canadian start-ups
  - Defer capital gains taxation on venture capital investments rolled into other e-business investments
  - Narrow the gap between Canadian and U.S. capital gains taxation rates
  - Eliminate barriers to cross-border share-for-share mergers
  - Eliminate impediments to the flow of foreign investment into Canadian venture capital funds

## A NATIONAL E-BUSINESS STRATEGY

The Roundtable has identified six priority areas for accelerating Canada's e-business leadership, articulated a set of goals for achieving success in each area, and suggested specific tactics for attaining these results.

### Framework For E-Business Leadership


1. Establish Canada's brand in e-business, domestically and globally
GOAL: Highest rates of Internet usage for businesses, government and citizens
2. Accelerate the transformation of existing businesses
GOAL: World's largest Internet-related industry as a % of GDP, highest SME adoption and usage
3. Foster e-business creation and growth
GOAL: World's largest pool of venture capital and IPOs as a % of GDP
4. Expand the e-business talent pool
GOAL: Attract e-business talent to Canada and achieve the highest rates of Internet literacy in the world
5. Make government online a major priority
GOAL: Most advanced digital government in the world
6. Build leadership in international e-business policy development
GOAL: Widespread adoption of Canadian trustmark

1. **Establish Canada's brand in e-business, domestically and globally by building awareness of and confidence in Canadian companies' ability to compete in the global Internet economy and by boosting our profile internationally.**

   **Canada's Goal should be recognized leadership in e-business by achieving the highest rates of Internet usage in the world.**

***Domestically, create a sense of awareness and urgency of the e-business challenge through private sector leadership on the part of business and industry associations.***

Roundtable members and other business leaders, supported by industry associations, will publicize and promote Canadian e-business success stories and monitor the country's progress along key dimensions. This private sector leadership will apply peer pressure and stimulate a sense of urgency among Canadian businesses to hasten adoption of e-business across sectors and within industry supply chains.

***Build Canada's brand internationally by running a fast, focused campaign to market Canada to leading global e-businesses as a destination for investment.***

Promoting Canada's leadership on the world stage will motivate potential e-business entrepreneurs and international investors to develop new businesses here, which will help build critical mass in our emerging clusters.

The Roundtable supports the creation of a government-sponsored e-business initiative that dovetails with the concept of the Investment Team Canada program announced in the October 1999 *Speech from the Throne*. Working with Investment Partnerships Canada, the Roundtable will participate in the development of an e-business pilot project to run a fast, focused campaign to market Canada among global e-businesses as a prime destination for investment.

2. **Accelerate the transformation of existing businesses in Canada by providing the incentives and the tools for business leaders to invest in e-business.**

   **Canada's Goal should be to achieve the highest rates of Internet usage among small and medium-sized enterprises (SMEs) in the world and to build the largest Internet-related industry as a percentage of GDP.**

***Create a time-limited tax incentive to raise awareness and adoption by all companies, and SMEs in particular.***

The Roundtable proposes the creation of a two-year, time-limited tax incentive – along the lines of the Y2K incentive – to raise e-business awareness and adoption levels by all Canadian companies, particularly SMEs. This incentive would be for investments in e-commerce technologies and would be in the form of accelerated depreciation. Like the highly successful Y2K tax incentive, this time-limited incentive should experience strong uptake among small businesses. The e-business incentive should take equal care in defining investments in e-business products or services, and which hardware and software applications fit the definition.

The objective of this initiative should be to drive Internet usage for buying and selling among SMEs to over 50% from the current levels in the 6% to 24% range over the next two years.

1. **Establish Canada's brand in e-business, domestically and globally** by building awareness of and confidence in Canadian companies' ability to compete in the global Internet economy and by boosting our profile internationally.

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   **Canada's Goal** should be to achieve the highest rates of Internet usage among small and medium-sized enterprises (SMEs) in the world and to build the largest Internet-related industry as a percentage of GDP.

   ***Create a time-limited tax incentive to raise awareness and adoption by all companies, and SMEs in particular.***

   The Roundtable proposes the creation of a two-year, time-limited tax incentive – along the lines of the Y2K incentive – to raise e-business awareness and adoption levels by all Canadian companies, particularly SMEs. This incentive would be for investments in e-commerce technologies and would be in the form of accelerated depreciation. Like the highly successful Y2K tax incentive, this time-limited incentive should experience strong uptake among small businesses. The e-business incentive should take equal care in defining investments in e-business products or services, and which hardware and software applications fit the definition.

   The objective of this initiative should be to drive Internet usage for buying and selling among SMEs to over 50% from the current levels in the 6% to 24% range over the next two years.

***Create a student e-Corps initiative, under the umbrella of Industry Canada's Student Connection program, to provide cost effective e-business resources to SMEs.***

To help bridge the Internet skills gap, particularly for SMEs outside major urban centres, the Roundtable supports the formation of a student e-Corps to provide college and university students with e-business training and qualifications. Under Canada's Student Connection program, an e-Corps program is now being developed to provide students with a placement inside a company, where they will assist in mapping out an e-commerce needs assessment or developing a Web site.

The Student Connection program has already placed over 3,000 students in the field to help SMEs; however, the e-Corps program will need to build its brand and presence in university and college faculties and in small business organizations across the country. The goal of the e-Corps will be to accelerate the placement rate to SMEs over the next two years by increasing the number of students placed.

***Accelerate sectoral adoption through industry association activities to mobilize members.***

Industry associations will play a key role in supporting the adoption of e-commerce on a sector-by-sector basis. The Roundtable encourages these associations to appoint high level executives to lead sectoral teams, to identify best practices and supply the enablers and infrastructure for stimulating e-commerce adoption and diffusion in each sector. E-commerce advisory councils, such as the one recently formed by the Retail Council of Canada, are an effective tool for mobilizing membership and should be supported by associations, the e-commerce supplier community and Industry Canada.

3. **Foster e-business creation and growth** by supporting Canada's emerging Internet clusters, ensuring that risk capital is available at all stages of business development, and by improving the incentives for entrepreneurs to build businesses in Canada.

**Canada's Goal** is to develop the world's largest pool of venture capital and the largest number of IPOs as a percentage of GDP.

***Support clusters by focusing research resources on Internet technologies.***

Although clusters cannot be engineered into existence, their evolution can be encouraged. Together, governments, the financial community and educational institutions can promote cluster formation by enhancing the linkages among capital, ideas and talent in emerging clusters.

Cluster development can also be stimulated through programs that focus available research dollars for e-business and Internet technologies within strategically-located universities. Resources focused on Internet technologies could be channeled through programs such as PRECARN, a consortium of companies, research organizations and government agencies performing collaborative research and development of new technologies, and focused in specific geographies.

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The financial community in each cluster must also step up to the challenge of supporting new business development and cluster formation. Like their U.S. counterparts, they could be more actively involved in building linkages and networks by sponsoring business plan competitions in universities or taking a stronger role in curriculum development that builds entrepreneurial skills.

With the right support in place, it should be possible to double the number of Internet-related jobs in each cluster over the next three years.

***Foster the development of early-stage venture capital.***

The Roundtable offers four proposals for increasing the ability of Canadian entrepreneurs to raise the capital they need in Canada, so that they can grow their e-businesses here.

- ***Permit deferred capital gains taxation on qualified investments.***
  To expand the pool of invested venture capital in Canada significantly, Canadian venture capital funds should be allowed to defer taxation from capital gains realized on exiting from an investment – provided that the proceeds are invested in another qualified investment. The investment would have to be an early-stage, seed investment in a company that qualifies as an Internet-related company. This rollover provision would enable the government to realize a significant taxation benefit upon final disposition.

- ***Reduce the capital gains tax.***
  The prospect of capital gains is a primary incentive for early-stage investors. Canada's current rates of taxation on capital gains are relatively high, thus reducing this incentive and driving many companies and individuals to move their business activities outside the country to avoid higher taxation.

- ***Eliminate barriers to cross-border share-for-share mergers.***
  Many Canadian start-ups avoid the complications of having status as a Canadian company by beginning life as a U.S. corporation. One set of complications arises from Canada's reorganization rules, which trigger a tax liability when a holder exchanges shares in a Canadian corporation for shares of a foreign corporation. Amending current rules to allow the rollover of shares on a tax-free basis at the time of a share-for-share merger or sale would allow Canadian companies to participate in these transactions on the same basis as their U.S. counterparts. Once the stock in the new company is sold, the shareholder would then realize a capital gain, and the tax revenue would flow to the Canadian government.

- ***Eliminate impediments to the flow of foreign investment into Canadian venture capital funds.***
  The flow of foreign investment into Canadian ventures and venture capital funds is currently limited by the fact that U.S. limited-liability companies (LLCs) are not covered by the tax treaty. If foreign investors pool their fund as part of a limited liability company in the United States to invest in a Canadian fund, they do not qualify for tax treaty benefits, and are therefore subject to capital gains taxation as if they were residents of Canada. To encourage foreign investment in Canadian companies and venture capital funds, there should be tax neutrality for non-resident investment in Canadian e-businesses.

***Address factors that make the environment for initial public offerings (IPOs) in Canada less attractive than in the U.S.***

Less attractive Canadian stock market listing requirements, resale restrictions and escrow requirements all contribute to a less vibrant Internet IPO environment in Canada than in the U.S. If Canada is to succeed in attracting and retaining Internet-related start-ups, securities regulators and other key stakeholders need to work to level the IPO playing field with that of the U.S.

**4. Expand the e-business talent pool in Canada by enabling companies to make better use of stock options to attract and retain employees and by accelerating skills training and retraining to meet the urgent supply needs of the Internet economy.**

**Canada's Goal should be to attract and retain a pool of e-business talent and to achieve among its broad population the highest Internet literacy rates in the world.**

***Adjust the tax treatment of stock options to allow a deferral of taxation until the time of sale of the stock, and permit limited capital gains exemptions.***

Giving employees stock options allows them to share in the upside wealth creation potential of a company and is a powerful mechanism for attracting and retaining talent. But Canada's current taxation regime, which makes stock options taxable immediately rather than when shares are sold, reduces their attractiveness as a form of compensation.

## Exhibit 25: Deferring Taxation of Options Until Shares Are Sold

| | |
|---|---|
| **Number of Options:** | 50,000 |
| **Strike Price:** | $1[1] |
| **Market Price at Exercise:** | $20 |
| **Market Price when Sold:** | $50 |

| | Status Quo ($000) | Proposed Deferral ($000) |
|---|---|---|
| Capital Gains at Exercise | 950 | 950 |
| Capital Gains Taxes Due[2] | 356 | 0 |
| Net Value[3] | 644 | 1,000 |
| Total Value of Shares at Sale (after 3 years) | 1,609 | 2,500 |
| Capital Gain at Sale | 966 | 2,450 |
| Capital Gain Taxes Due | 362 | 919 |
| NPV of Net Gain for Individual[4] | 1,040 | 1,277 |
| NPV of Capital Gains Taxes Paid[4] | 658 | 766 |

**Deferral results incremental tax revenue of $107,830 (NPV)**

**Notes:**
(1) Assumes that pricing permits option gains to be taxed as capital gain
(2) Assumes 37.5% capital gains tax rate
(3) Assumes stock is sold to pay capital gains tax
(4) Discount rate of 6.25% used

**Source:**
BCG Analysis

To level the playing field between Canada and the U.S., taxation of the option benefit should take place at the time of sale of the stock, thus allowing employees to preserve their ownership position as the company grows. As Exhibit 25 shows, adjusting the taxation of options could increase tax revenues as well as the capital gains of the employee.

There are other levers for attracting and retaining Internet talent in Canada. For instance, the Ontario government is considering capital gains tax exemptions of up to $1 million for employees of qualified science and technology intensive companies. This would build on the $500,000 capital gains tax exemption for qualifying small businesses and extend it to gains from employee stock options and subsequent shares up to a maximum of $1 million.

***Improve Internet literacy by making the International Computer Driving License a prerequisite for secondary and post-secondary graduation.***

An Internet-literate population, across all ages and income levels, is a prerequisite to a healthy Internet economy in Canada. While the majority of Canadians have access to the Internet, they have varying levels of comfort and skill in online navigation. To promote Internet literacy, the Roundtable recommends the adoption of the International Computer Driving License (ICDL), an international accreditation program that covers all of the basic skills required to be fully computer and Internet literate.

The ICDL was developed in the EU and has met with success: it has registered more than 500,000 people and is widely used in secondary and post-secondary institutions, as well as in companies as a prerequisite for many jobs.[16] Canadian organizations and institutions should similarly adopt the ICDL and promote its usage in both the workplace and in educational settings.

Canadian businesses must invest in Internet-educating their employees, particularly senior managers, whose comfort with the Internet is critical to ensuring more widespread adoption of e-business. Corporations can use the ICDL as hiring criterion, while governments can also play a major role in driving adoption of the ICDL in their hiring practices.

5. **Make government online a major priority for all governments in Canada by assigning leadership responsibilities and setting aggressive targets.**

   **Canada's Goal is to become the most advanced digital government in the world. By 2004, Canada's government should be completely online.**

Governments can play a major role in accelerating the adoption and usage of e-business across the economy and throughout society. The breadth of government services, its heft as an employer, and its position as a procurer of goods and services make the public sector a powerful user of and catalyst for e-business.

***Set aggressive targets for online government.***

While many governments in Canada are now putting government services and procurement online, these initiatives lack visibility and coordination across departments and levels of government. The leadership required to drive this must come from the very highest levels of government. The Roundtable recommends that aggressive targets be set – for percentage of services online, percentage of procurement online, etc. – and that progress be monitored regularly against these targets.

***Create a government portal or online directory and search engine to improve access to information.***

Driving government online will improve access to information and service levels for both business and citizens that interface with governments. To facilitate this interface, the Roundtable also recommends that a government portal or online directory and search engine be created. This portal would serve as the single point of entry for Canadians and others who wish to access government information and services for any level of government.

6. **Build Canada's leadership in international e-business policy development by establishing a Canadian branded, international consumer protection mark and forum for dispute resolution.**

   **Canada's Goal is to become a recognized centre of international Internet policy development, with widespread adoption by Canadian sites of the trustmark by 2002.**

Canada has played an important role to date in world forums for developing international standards and policies to facilitate electronic commerce. Canada hosted the 1998 OECD Ministerial Conference on Electronic Commerce and has been involved in such international roundtables as the Global Business Dialogue on E-Commerce.

[16] The Boston Consulting Group interviews

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[16] The Boston Consulting Group interviews

***Build Canada's national e-brand in the area of enlightened e-business policy development.***

There is room for expanding Canada's international role and prominence in an effort to build a national brand for Canada in international e-business. Consumer privacy and protection are emerging as major inhibitors to the development of e-business globally, and currently there is no dedicated, neutral decision-making body responsible for setting and monitoring a clear set of rules. Canada occupies an important middle ground between the free market ideals of the U.S. and the more interventionist philosophy and approach of the EU. Canada is, and should be positioning itself as, the ideal mediator for these differences, using its consumer protection guidelines as a model for objective standards.

***Create an internationally accepted trustmark for consumer protection.***

The Roundtable recommends the establishment of an internationally recognized trustmark or seal of approval that can appear on the Web sites of companies that comply with Canadian consumer protection guidelines. While it makes sense to launch this initiative in Canada first, the goal should be to migrate it quickly into an international standard providing a higher level accreditation recognized across borders.

Many stakeholders will need to be involved in developing this trustmark, including the retail business sector, consumer groups, government and organizations such as CSA International (formerly the Canadian Standards Association), which developed the CSA Privacy Code that has provided the basis for federal legislation in this area.

The development of the trustmark should be led by the private sector, and should be managed by a neutral third party with a mandate to build awareness, to promote its adoption, to monitor compliance and to provide a mechanism for resolving disputes.

## MOVING FORWARD

This report of the Canadian E-Business Opportunities Roundtable is intended to stimulate discussion and action in all communities that have the power to drive the development of the Internet economy in Canada. Creating an attractive environment for new economy businesses must become a priority for Canada in order to capture its share of the global Internet economy and drive economic growth and job creation. Similarly, existing Canadian companies, educators and governments need to recognize both the threat and the opportunity of e-business and move aggressively to embrace new ways of doing business, to protect Canadian jobs and quality of life.

The Roundtable intends to engage all of these communities – business, government, and education – in a strategy to accelerate Canada's global e-business leadership. The Roundtable will work within the private sector to encourage Canadian companies to move quickly to seize the Internet advantage and partner with Canadian governments to help drive the e-business agenda.

# APPENDIX A: BEST E-BUSINESS PRACTICES IN GOVERNMENT

The Roundtable's research into the factors that could influence the development of the Internet economy in Canada included a look at what governments in other countries are doing to achieve this goal. As in Canada, many governments are actively focused on the issue of e-business, and this is reflected in numerous initiatives with a very broad reach. Foreign governments that are moving forward aggressively are focusing on several areas that constitute best practice in the application of electronic processes in government:

**A National Policy Framework**

The existence of a national policy framework coordinated at the executive level is widely regarded as critical to establishing an e-business agenda. In the U.K., for example, the government issued its report, *ecommerce@its.best.uk*, that sets out its vision for using e-business to build a modern, knowledge-driven economy. This initiative, like others in the U.S. and Australia, is being coordinated at the highest level of the government and involves a mechanism for reporting directly to the chief executive.

**Electronic Purchasing and Payment**

A number of countries are rapidly moving the bulk of their purchasing and payments activities online, as well as the delivery of a substantial portion of their transfer payments to individuals. The current U.S. government, for example, has adopted the use of electronic catalogues and malls to facilitate the handling of low cost, high volume purchases. It is also making extensive use of several electronic posting systems to facilitate the process of requesting bids on government contracts.

In addition, the U.S. government has targeted a number of transfer programs, principally welfare benefits, such as food stamps, and student aid for delivery through electronic means. The U.S. has set extremely aggressive targets for the conduct of government business online, and the pressure to meet these targets is reinforced by the requirement of an annual progress report presented to Congress.

**Emerging Taxation Policies for E-Business**

In the Internet space, national borders have evaporated raising difficult questions regarding taxation. Several governments, including those of Ireland and the EU, are actively considering these issues. In the U.S., a private sector advisory panel is examining the application of local, county, state and federal taxes for goods sold over the Web, and is expected to report in March 2000.

**Expanding Information Infrastructure**

Upgrading and expanding broadband access and telecom infrastructure is a priority for countries on the frontlines of e-business. In Australia, for example, a National Bandwidth Inquiry is focusing on the adequacy of Australia's Internet bandwidth for the coming five years. In July 1999, Ireland entered into an agreement with the U.S. company Global Crossing to supply two fibre optic cables to link Ireland with the U.S. and 24 European cities at 15 times current international capacity.

**Technology Transfer and Support for Small Business**

Many governments are providing technical leadership and support to small and medium-sized enterprises (SMEs) to foster e-business development. For example, the U.S. Department of Defense has established 17 Electronic Commerce Resource Centers (ECRCs) throughout the country. Run by private, not-for-profit contractors and integrators, these centres are used to train firms in the Department of Defense supply chain to use e-commerce in their dealings with government and industry.

For a more detailed discussion of these and other government e-business initiatives, see Professor David Wolfe's paper, "Government Support for E-Business: Comparative Experiences" at www.utoronto.ca/cis/progris.html#pub

# APPENDIX B: A NOTE ON METHODOLOGY

Although there are measures of the value of e-commerce in Canada, no consistent, widely used measure of the value of e-business more broadly yet exists. Estimates contained in this report adapted the methodology used in the University of Texas at Austin study, "Measuring the Internet Economy" sponsored by Cisco (released Spring 1999, updated October 1999) which estimated the total Internet economy generated by U.S.-owned companies, both domestically and abroad, in terms of revenue and jobs. The study divides the Internet economy into four layers:

**Infrastructure:** companies that manufacture or sell products or services that together make up the IP based Internet network infrastructure (e.g., Cisco, Dell, MCI/Worldcom, AOL)

**Applications:** companies that manufacture or sell products or services that build on the Internet infrastructure to make it possible to perform business transactions online (e.g., Netscape, Adobe, Oracle, Scient)

**Intermediary:** Internet-based facilitators of interaction between buyers and sellers, brokers, agents, portals and content providers (e.g., Ariba, E*Trade, Yahoo!, Doubleclick)

**Commerce:** companies that sell products or services to consumers or businesses over the Internet (e.g., Amazon.com, eToys.com, IBM)

Adapting this four-layer framework, we developed an estimate of the Internet economy in Canada based on data available on the Information and Communications Technology sector in Canada, together with data from The Boston Consulting Group studies, International Data Corporation (IDC), the Internet Advertising Bureau, Statistics Canada and company interviews. Because of an absence of available data on the Canadian Intermediary layer, the Commerce and Intermediary layers were collapsed into one (Commerce), and only the travel, brokerage and portal advertising aspects of the Intermediary layer were included in the overall estimate. To ensure proper comparison, the U.S. Commerce and Intermediary layer figures were adjusted based on interviews with researchers at the University of Texas at Austin.

Revenues for the Infrastructure layer were estimated based on Industry Canada data for the Information and Communications Technology (ICT) sector. Specifically, estimates (based on industry interviews) of 50% of Communications and Other Electronic Equipment and Electronic Computing and Peripheral Equipment categories, 10% of Telecom Services category, 20% of Computers and Packaged Software and Other Electronic Machinery Services category were used. Added to this was The Boston Consulting Group's estimate of the 1998 Internet Service Provider (ISP) market in Canada.

Revenues for the Applications layer were estimated based on Industry Canada data on the Software Development and Computer Service Industry. Only the sub-categories of Software Product Development and Professional Services were included. Of these, 10% were assumed to be Internet related.

Revenues for the Commerce layer (including intermediaries) were estimated based on IDC business-to-business and business-to-consumer e-commerce data,[17] The Boston Consulting Group research for shop.org, and data from the Canadian arm of the Internet Advertising Bureau.

Revenues were converted to contribution to GDP at the rate of 2.2:1 to factor out double counting.

[17] Estimate includes Internet-based e-commerce only. Total electronic commerce, including transactions through EDI/VAN, was worth an estimated $45 billion in Canada in 1998. See the forthcoming BCG report, "Mission Critical: Mobilizing for Business-to Business E-Commerce"

Employment estimates for the Infrastructure and Applications layers were calculated using average revenue/employee figures based on an average of University of Texas study data and Statistics Canada ICT industry data. Employment data for the Commerce layer was calculated using average revenue/employee figure based on the University of Texas study, and the average revenue/employee figure for the leading business-to-consumer and business-to-business pure-play Internet companies.

Growth rates are based on The Boston Consulting Group's business-to-business and business-to-consumer growth forecasts (for Commerce layer), IDC "Worldwide Internet Services, Market Trends and Forecast, 1998-2003" growth forecast (for Applications layer) and IDC, "Building the Internet Infrastructure: Forecast of Public Data Network Spending, 1997-1992" growth forecast (for Infrastructure layer).

# APPENDIX C: WORKING GROUP MEMBERS

| | | |
|---|---|---|
| Sara Allan | Manager | The Boston Consulting Group |
| John Barry | Executive Advisor, Global Development | Teleglobe Inc. |
| Christopher Booth | VP, Enterprise Technology Services | Ontario Hydro Services Company |
| Shauna Brail | E-Commerce Research Specialist | The Boston Consulting Group |
| Kevin Bright | Project Leader | The Boston Consulting Group |
| Jim Carney | Planning and Sales Operations | EDS Systemhouse Inc. |
| Robert Crow | VP, Policy | Information Technology Association of Canada (ITAC) |
| Debbie Dimoff | VP, E-Business Development and Communication | Bank of Montreal |
| André Dubois | Director, ICT Branch | Industry Canada |
| Vicki Fowles | Department of Political Science | University of Toronto |
| Ken Grant | Director, School of Information Technology Management | Ryerson Polytechnic University |
| Julie Gray | Associate | The Boston Consulting Group |
| Jim Ingratta | General Manager E-Business, Consulting & Services | IBM Canada Ltd. |
| Ken Jones | Director, Centre for the Study of Commercial Activity | Ryerson Polytechnic University |
| Paul Kennedy | Executive Director, E-Commerce Program | Information Technology Association of Canada (ITAC) |
| Michael Leiter | Vice President, Academic | Acadia University |
| John Macris | Consultant | The Boston Consulting Group |
| Jeff McNamee | VP, Business Development | SofTV.net Inc. |
| Pamela Miller | Senior Policy Advisor, Electronic Commerce Task Force | Industry Canada |
| Heather Nicol | CFO, Chapters Online | Chapters Inc. |
| Geoff Oliver | Senior Economic Policy Advisor, Electronic Commerce Task Force | Industry Canada |
| Keith Parsonage | Director General, Information and Communication Technologies Branch | Industry Canada |
| Sandra Pawlick | Director, CommerceNet | Information Technology Association of Canada (ITAC) |
| Richard Simpson | Director General, Electronic Commerce Task Force | Industry Canada |
| David Sturdee | Consultant | The Boston Consulting Group |
| Robert Tritt | Director, International Trade and Regulation | BCE Inc. |
| David Wolfe | Professor, Department of Political Science | University of Toronto |

# APPENDIX D: ORGANIZATIONS INTERVIEWED

A Type Media Group
Acadia University
Accompany Inc.
Alberta Government, Ministry of Innovation and Science
Alliance of Manufacturers & Exporters Canada
Anderson Soublière Inc.
AOL Canada Inc.
Ariba Inc.
Art Technology Group Inc.
Autonet.ca Partnership
Babycenter Inc.
Bay Area Regional Technology Alliance (BARTA)
BC Pension Fund – Ministry of Finance and Corporate Relations
BC Technology Industry Association
BCE Inc.
Bombardier Inc.
Boston Redevelopment Authority
Boston Software News
Brightspark
British Columbia Technology Industries Association
Business Development Bank of Canada
Cambridge Community Development Department
Cambridge Incubator
CAMP, Washington D.C.
Canadian Association of Internet Providers (CAIP)
The Canadian Chamber of Commerce
Canadian Consulate (New York)
Canadian Consulate (San Francisco)
Canadian Federation of Independent Business
Canadian Pacific Railway Co.
CANARIE
Canoe Ltd.
Capital Alliance Venture
CATA Alliance
CDPlus.com Inc.
Celtic House International
Centennial College
Chapters Inc.
CIBC
City of Chicago, Assistant to the Mayor
Client Logic.com
Club Monaco
Cogeco Inc.
CommerceNet
CommerceOne Inc.
Communications and Information Technology Ontario
Compaq Canada Inc.
Conference Board of Canada
Cyber District
Cyberplex Inc.
Dofasco Inc.
double decker studios
E-Commerce Council of Canada
Ecom Park Inc.
Electronic Commerce Centre (NB)
exclamation! Inc.
Export Development Corporation
Extend Media Inc.
Federal Express Canada Ltd.
Fingerhut
First Marathon Capital Partners
Ford Motor Company of Canada
Greenstone Venture Partners
Home Depot Inc.
HotHaus Technologies Inc.
Hudson's Bay Company Ltd.
Hyperion Resources Corp.
IBM Canada Ltd.
Illinois Coalition
Industry Canada Student Connections Program
Information Technology Association of Canada (ITAC)
Inno-centre
International Computer Driving License (ICDL) Canada
Investment Partnerships Canada
JetForm Corp.
Joseph Vardi (Israel)
Key Porter Books
Macdonald & Associates Ltd.
Macys.com Inc.
Magna International Inc.
Mass High Tech
Massachusetts Electronic Commerce Association
Massachusetts Interactive Media Council
Massachusetts Software Council
McLean Watson Capital
Metalsite L.P.
The Microsoft Network Canada Group Corp.
Mosaic Venture Partners
Mountain Equipment Co-op
Multiactive Software Inc.
Multimediator Strategy Group

## ORGANIZATIONS INTERVIEWED

NCompass Labs
NetCentives Inc.
Netcoalition, Washington D.C.
Netcom Canada
NetNation Communications Inc.
New Media BC
Noranda Inc.
The NRG Group
Office of Management and Budget, Executive Office of the White House, U.S. Government
Ottawa Centre for Research and Innovation
Petkevich and Partners
Pivotal Corp.
Planet 411.com
Primus Telecommunications, Inc.
Procure.com
Public Technologies Multimédia Inc.
Queen's University – School of Business
Retail Council of Canada
Rogers Communications Inc.
Royal Bank Growth Corporation
Ryerson Polytechnic University
San Francisco Partnership
San Francisco Planning Department
ScienceTech Communications
Sears Canada Inc.
Shift Magazine
Shipper.com
Silicon Valley NORTH
Silverweave Interactive
Simon Fraser University
Sitel Corp.
Skypoint Capital Corporation
Smart Valley
Softbank Technology Ventures
Stanford University – Graduate School of Business
Sterling Software Inc.
Tanning Technology Corp.
Technology University of BC
Teleglobe Inc.
Telsoft Ventures Inc.
Timberjack Inc.
Tom Sweeny, Former President of Dunn & Bradstreet E-Commerce
TVisions
University of California at Berkeley – Berkeley Roundtable on Internet Economy (BRIE)
University of Toronto
University of Waterloo – Department of Computer and Electrical Engineering
U.S. General Services Administration
U.S. Government, Department of Defence
U.S. Government, Office of Management & Budget
UUNet Canada Technologies, Inc.
VentureOne
Ventures West
Webgrrls Canada
webHancer Corporation
WebHosting.com
West Teleservices Corp.
Western Technology Seed Investment Fund
Working Ventures Canadian Fund Inc.
Yorkton Securities Inc.
Zefer Corp.

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